# REPORT

OF THE

# BOARD OF STATE ENGINEERS

OF THE

# STATE OF LOUISIANA

TO

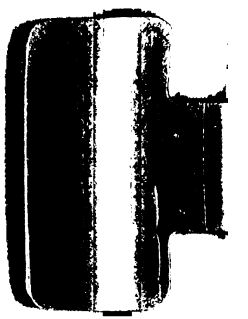
HIS EXCELLENCY, MURPHY J. FOSTER,
GOVERNOR OF LOUISIANA.

FROM

APRIL 20, 1898, TO APRIL 20, 1900.

---

BATON ROUGE:
PRINTED BY THE NEWS PUBLISHING COMPANY.
1900.



# REPORT

OF THE

# BOARD OF STATE ENGINEERS

OF THE

Compliments of

Board of State Engineers.

TER,

GOVERNOR OF LOUISIANA.

FROM

APRIL 20, 1898, TO APRIL 20, 1900.

BATON ROUGE:
PRINTED BY THE NEWS PUBLISHING COMPANY:
1900.

# Report of the Board of State Engineers.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
New Orleans, La., April 20, 1900.

*To His Excellency, Murphy J. Foster, Governor of Louisiana:*

SIR:—The following report, covering the period from April 20, 1898, to April 20, 1900, with accompanying appendices, is respectfully submitted for your Excellency's information.

## DUTIES OF THE BOARD.

The Board of State Engineers was created by Act 33, approved February 10, 1879. As defined by this act the duties of the Board are to make surveys of water courses, public works and levees of the State; to "report to the Governor of the State the improvement necessary and the levees to be constructed, which are of prime importance to the State at large;" to furnish estimates and specifications of the work so required; to examine and measure the work recommended by the Board and done under contracts made by the State, and to certify the amount of payments due for work thus executed.

Under the provisions of later laws they have been made, in general terms, the engineers and advisers of twelve out of the thirteen Boards of Levee Commissioners now organized in the State, viz:

1. The Fifth Louisiana Levee District, by Act 44, of 1886;
2. The Tensas Basin Levee District, by Act 59, of 1886;
3. The Red River, Atchafalaya and Bayou Bœuf Levee District, by Act 79, of 1890;
4. The Pontchartrain Levee District, by Act 95, of 1890;
5. The Atchafalaya Basin Levee District, by Act 97, of 1890;
6. The Lafourche Basin Levee District, by Act 13, of 1892;
7. The Lake Borgne Basin Levee District, by Act 14, of 1892;
8. The Caddo Levee District, by Act 74, of 1892;
9. The Bossier Levee District, by Act 89, of 1892;

10. The Buras Levee District, by Act 18, of 1894;
11. The Cat Island Levee District, by Act 110, of 1894.
12. The Grand Prairie Levee District, by Act 24, of 1898.

In the Orleans Levee District, under the provisions of Act 79, of 1892, the only duty of the Board of State Engineers is to approve or disapprove the "location, construction and repairs of all levees on the river front of said district."

Act 144, of 1888, makes it the duty of the Board "to furnish such lines and levels, plans and estimates as may be considered necessary for the proper and efficient execution of the "work" to be done by the Board of Control of the "New Basin Canal."

Article 294, of the Constitution of 1898, directs that the Board "whenever called on so to do, shall furnish the different road districts with plans and specifications for public roads, and such assistance and advice as will tend to create a uniform system of public roads throughout the State;" and under Article 239 it devolves upon the Board, in certain cases, to give or withhold to the Boards of Commissioners of the several Levee Districts of the State authority to contract with or permit steam railroad corporations to construct, maintain and operate railroad tracks upon the public levees.

The performance of these duties has required the constant care and attention of the members of the Board during the past two years, and has required the regular employment of two or three surveyors and rodmen as assistants in the field, as well as the temporary services of other employees both in the field and in the office.

During the period covered by this report, the several members of the Board of State Engineers have given their attention, as heretofore, to the affairs of all the levee districts, and to duties in any of them as occasion might require; as a matter of convenience, however, Assistant State Engineer Lewis has given special attention to the work required in the Lafourche Basin Levee District, the Lake Borgne Basin Levee District, the Buras Levee District, the Grand Prairie Levee District, and for a part of the time in the Pontchartrain Levee District; Assistant State Engineer Thompson has attended to duties required in the Fifth Louisiana Levee District, and a part of the time in the Pontchartrain Levee District; Assistant State Engineer Kerr to

those in the Caddo Levee District, the Bossier Levee District, the Red River, Atchafalaya and Bayou Bœuf Levee District, and to those required for the work of the Tensas Basin Levee District in Arkansas; and Assistant State Engineer Perrilliat has performed the duties required in the work of the Atchafalaya Basin Levee District, and attended to most of the work called for by the Board of Control of the New Basin Canal and Shell Road.

## LEVEE WORK OF THE PAST TWO YEARS.

The improvement of levees in Louisiana and in that part of Arkansas upon which we are dependent for protection, has been continued during the period covered by this report, by the work of the several levee districts, the State and the United States.

The work thus done since April 20, 1898, sums up approximately as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the Levee Districts | 40.90 | 97.70 | 6,873,205 | $1,096,690 81 |
| By the State | 25.58 | 24.06 | 2,301,967 | 312,079 28 |
| By the United States | 25.53 | 167.47 | 9,617,354 | 1,586,187 13 |
| Aggregates | 92.01 | 289.3 | 18,792,526 | $2,994,957 22 |

As regards locality, the work has been divided as follows:

| LOCALITY. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| IN ARKANSAS: | | | | |
| On the Arkansas River | 1.50 | 12.40 | 353,164 | $ 62,512 13 |
| On the Mississippi River | 0.24 | 59.57 | 1,780,857 | 269,017 54 |
| IN LOUISIANA: | | | | |
| On the Mississippi River | 45.37 | 162.74 | 11,864,298 | 1,961,527 42 |
| On the Red River | 21.39 | 4.14 | 1,369,627 | 181,714 25 |
| On Bayou Rapides | ..... | 1.40 | 36,357 | 8,863 83 |
| On Bayou des Glaizes | 5.51 | 1.89 | 232,184 | 21,881 84 |
| On the Atchafalaya River | 1.20 | 13.72 | 354,700 | 58,489 95 |
| On Bayou Lafourche | 16.80 | 33.37 | 2,801,339 | 430,950 26 |
| Aggregates | 92.01 | 289.23 | 18,792,526 | $2,994,957 22 |

In addition to this a considerable amount has been expended by the levee districts and by the United States for weed cutting, high water protection and minor repairs to levees, and for wooden revetments which have been built by some of the districts. The cost of this class of work, except in a few instances, has not yet been reported to this office.

Details as to location, character, extent and cost of the levee work of the past two years are given in the following remarks relative to "The Levee Districts," and in tabular form in Appendix A.

## THE LEVEE DISTRICTS.

The creation of the Grand Prairie Levee District by Act No. 24, of 1898, makes the present number of corporate levee districts in the State thirteen. They are given corporate powers, under the administration of boards of commissioners varying in number from three to nine. All of these districts, except the Orleans Levee District, are empowered to levy ad valorem taxes for levee purposes, not exceeding the constitutional limit of ten mills on the dollar, and to impose local assessments upon the lands and railroads. Most of them are also empowered to levy local assessments upon the agricultural products raised within their territory, and all of them have the authority to issue bonds. Most of them have done so, the aggregate of their bonded indebtedness being at present about $3,581,200.

All of the bonds originally authorized, except those of the Orleans Levee District, bore six per cent. interest and generally had a comparatively short term to run before the time fixed for redemption. But the Act of 1898 (No. 14, giving effect to Article 239 of the Constitution), authorizes the several Boards of Levee Commissioners, with the consent of the holders, to issue bonds bearing five per cent. interest to become due in fifty years from date of issue, in lieu of those already authorized. This authority has already been exercised by some of the districts, apparently with most advantageous results to the public interest.

Details of amount of bond issues, rate and amount of taxation and local assessment by the several districts of the State, are presented in tabular form in Appendix B.

*Tensas Basin Levee District.* All of the levee work undertaken by this district, during the past two years, has been put

upon the line of public levees in Arkansas, aiding in protecting the district from overflow.

This work has been as follows, viz: 0.67 miles of new levee and 5.78 miles of enlargement, amounting to 327,832 cubic yards of earthwork, costing $58,726.33

A considerable sum was also expended by the district in high water expenses, weed cutting, etc., the exact amount of which we have been unable to ascertain.

During this period the United States also built and enlarged about 65.43 miles of levee in the State of Arkansas to aid in the protection of the Tensas Basin Levee District, amounting to 1,673,427 cubic yards and costing $250,773.89, and, in conjunction with the Tensas Basin Levee District and the United States, the Arkansas Levee Boards, 1.83 miles of levee work, amounting to 132,762 cubic yards, costing $22,029.45.

All of the work thus undertaken has been completed, and the line of public levee in Arkansas in which the Tensas Basin Levee District has a direct interest, may at this time be said to be, generally, in a far better condition than at any time in the past, and, except for such defects as can only be discovered by actual test, should be equal to any flood that has, so far, ever passed Arkansas City.

This should not, however, be accepted as indicative of such an improved condition as to warrant those charged with the conduct of the affairs of the district to relax their efforts towards further improvement.

Improved grades and larger sections will become necessary, from time to time, and caving banks, at one point and then another, must be expected sooner or later to affect the integrity of the levee line in many localities, all of which will require from those in interest strenuous efforts and large means to provide for the work involved.

*Fifth Louisiana Levee District.* The work in this district during the past two years consisted in raising and enlarging all levees which were deficient in section or were overtopped by the high water of 1897, to a grade and section that would safely withstand a flood three feet above said stage. The united efforts of the United States, State and district authorities have been highly gratifying in this undertaking, and there is, at this date,

only 5.9 miles of levee line which is less than one foot above the 1897 water (as it stood at each point), while in 1897 there were 28 miles which had to be topped and strengthened under most unfavorable conditions to withstand the flood.

It was also intended at the outset to place the entire line to a grade not less than three feet above the highest known water, and many contracts were made and partially completed, but owing to extreme caving of river banks in many bends, which necessitated heavy expenditures for the construction of new levees to cover threatened points, many stretches of existing levee which stood from about level with to two and a half feet above high water, and were of reasonably good section, had to be left for future available means to continue the work.

New levees had to be constructed at Cottonwood, Longwood, Elton and Salem, in East Carroll Parish; at Sparta and Delta Landing, in Madison Parish; at Evergreen, Bondurant, Claggett, Inge Field, Cottage Home, Minnehaha and Kempe, in Tensas Parish, and at Forest Home, in Concordia Parish. There are also many points now threatened where large and expensive levees will be required during the coming season.

While the levee work of the last two years has been generally built to a grade of three feet above the high water mark of 1897 at the immediate points where work was being done, this was only adopted as a temporary grade so as to bring the entire line to some uniformity at the earliest possible moment, with a view of hereafter, as means become available, placing the same to the grade recommended by the Mississippi River Commission as proper, without any breaks in the entire levee system, to withstand a greater flood than heretofore known.

This recommended grade for the levee line of the Fifth Louisiana Levee District would be about as follows:

At Arkansas and Louisiana Line, about 5.5 feet above high water of 1897.

At Lake Providence, about 5.5 feet above high water of 1897.

At Henderson, about 5.0 feet above high water of 1897.

At Delta, about 4.6 feet above high water of 1897.

At St. Joseph, about 5.0 feet above high water of 1897.

At Vidalia, about 6.2 feet above high water of 1897.

At Red River, about 4.3 feet above high water of 1897.

The bank revetment which has been placed to prevent caving of river banks at Louisiana Bend, Lake Providence, Delta Point, and at Kempe Bend, has proved of the greatest benefit to the levee interests of the district, not only saving the expense of building new levees, which would throw out of levee protection some of the most valuable cultivable lands, and cost an enormous amount, but in some cases, where the new levees, which would otherwise have been required, would have involved such extensive work as to make their completion in one season doubtful, the revetment work has been essential to save the district from overflow. It is, therefore, hoped that this work may be extended where commenced, and that other caving bends where large interests are at stake may be treated in like manner.

It was hoped at the date of our last report that the system of levees might be found by this time so greatly improved that its extension down the river across and below Bougere crevasse might be commenced. But to undertake this extension until ample means are available to maintain the existing line of 217 miles in Louisiana, and 85 miles in Arkansas, would result in little benefit to river improvement, to the levee system, or to the local interests which are now affected by its remaining as at present. We feel, however, that no effort should be spared to secure the means necessary for such an extension of the levee system at the earliest date possible.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States is approximately as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the District | 4.05 | 19.82 | 1,133,338 | $ 181,992 22 |
| By the State | 2,75 | 1.70 | 581,754 | 88,653 70 |
| By the United States | 16.18 | 37.38 | 4,141,590 | 781,514 67 |
| Totals | 22.98 | 58.90 | 5,856,682 | $1,052,160 59 |

The district has paid for weed cutting, drainage, repairing wave wash, and for high water expenses during the past two years, $47,931.72.

A tabular statement showing the present elevation of the levees above the high water of 1897, with an approximate estimate of the earthwork required to enlarge the existing levees to a grade three feet above high water of 1897, and to build new levees to same grade at points where the present line is threatened in the near future by caving river banks, will be found in Appendix C.

*Atchafalaya Basin Levee District.* During the last two years a large amount of levee work has been carried on in this district. The district authorities have exerted themselves to the full extent of their resources. They have also anticipated the revenue of the coming year in order to carry on without interruption their levee work. A portion of the State levee funds have also been expended in this district, as is usually done, and the Mississippi River Commission has made large allotments for levee work in the district from the United States Government appropriations for the improvement of the Mississipi River.

By mutual understanding between the United States Engineers and the District Commissioners, the levee work on the Mississippi River, between Barbres Landing and Port Allen, has generally been carried on by the United States Government authorities, while the work between Port Allen and Donaldsonville has been done with the district funds, the State allotments being expended on the Mississippi River at those points designated by the Board of Commissioners for the district, regardless of the above mentioned division.

In addition to this the district has done a large amount of work on Bayou Lafourche, distributing it generally between Donaldsonville and a point six miles below Lockport, while the district has also carried on some work of enlargment and new levee construction on the Atchafalaya River.

The levee front of the Atchafalaya Basin Levee District consists of very nearly 233 miles of levee, distributed as follows: 128 miles on the Mississippi River, 30 miles on the Atchafalaya River, and about 75 miles on Bayou Lafourche. The exact proportion of this levee line covered by levee work during the past two years, can be ascertained by comparing these lengths with the following tabulated statement showing the number of miles of new levee and enlargment carried on within the limits of the district by the district, the State and the United States:

| WORK DONE. | Miles of New Levee. | Miles of Enlargement. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| **ON THE MISSISSIPPI RIVER.** | | | | |
| By the District | 2.22 | 22.18 | 1,375,106 | $238,495 82 |
| By the State | 1.30 | 3.80 | 285,683 | 43,871 83 |
| By the United States | 0.96 | 18.36 | 1,292,087 | 186,943 23 |
| Totals | 4.48 | 44.34 | 2,952,876 | $469,310 88 |
| **ON THE ATCHAFALAYA RIVER.** | | | | |
| By the District | 1.16 | 10.20 | 283,762 | $49,326 71 |
| **ON BAYOU LAFOURCHE.** | | | | |
| By the District | 5.53 | 27.84 | 1,579,327 | $244,404 69 |
| **RECAPITULATION THROUGHOUT THE DISTRICT.** | | | | |
| By the District | 8.91 | 60.22 | 3,238,195 | $532,227 22 |
| By the State | 1.30 | 3.80 | 285,683 | 43,871 83 |
| By the United States | 0.96 | 18.36 | 1,292,087 | 186,943 23 |
| Grand totals | 11.17 | 82.38 | 4,815,965 | $763,042 28 |

The work done by the United States Government has been generally built to the provisional grade adopted by the Mississippi River Commission, which is 4.4 feet above the high water of 1897 at Red River Landing, and 4.2 feet above the same plane at Donaldsonville. The work done by the District Levee Board has been built to a grade generally three feet above the highest flood plane of the past, which is everywhere the high water of 1897, except on the lower portions of Bayou Lafourche, where this plane has been superseded by the high waters of 1898 and 1899. The same rule has governed the work done under the State allotments in this district. the reason therefor being the desire of the local authorities to cover as great a length as possible of their levee line, giving it a margin of safety sufficient to withstand, without danger, a repetition of the highest floods of the past.

Owing to the comparatively low flood stages which have prevailed in 1898 and 1899, the rate of caving within the limits of the Atchafalaya Basin Levee District has been fairly low, and comparatively few new levees of great magnitude have had to be constructed. A season of extreme flood height, however, with its resultant increase of caving, would in all probability necessitate the construction of several large new levees, which would require a very heavy yardage and cost a large amount. In Appendix C will be found a table giving the elevation of the levee line in the Atchafalaya Basin Levee District above the flood level of 1897, and also estimates of the number of cubic yards which would be approximately required to raise this line of levees to the provisional grade adopted by the Mississippi River Commission, and described above. This table also enumerates the new levees which will probably be required within the next two years, and gives the approximate number of cubic yards which will be required in their construction.

On Bayou Lafourche the district has pushed its work vigorously, although the physical conditions prevalent on this stream have been somewhat discouraging to the prosecution of further levee work on the lower bayou. For instance: although the levees on Bayou Lafourche, fifty miles below Donaldsonville, are as high as the levees situated at a like distance below Donaldsonville, on the Mississippi River, yet an excessive flood height is reached on the bayou in that vicinity, overtopping the levees on its banks, when the water in the Mississippi River, at the head of the bayou, is still 5.25 feet below the maximum stage. A study of the hydraulics of this stream indicates that the flow of water in Bayou Lafourche—in other words, its discharge, is impeded by the physical conditions which prevail in it, causing abnormal flood heights some fifty miles below the head of the bayou which are not at all comparable to the stage of water in the Mississippi River at its head. The conclusion to be drawn from these conditions, is that an unreasonable amount of earthwork would have to be done to bring the levees on lower Bayou Lafourche to anywhere near a sufficient height, which would involve the expenditure of sums of money clearly beyond the means of the district authorities, and create a condition of affairs fraught with danger in case of breaks in the levees of such abnormal height. A study of these conditions has led the en-

gineers who have given them attention, and the thinking people of the locality, to request of the National Government the closure of Bayou Lafourche, at its head near Donaldsonville, with a lock which would relieve them from further danger of overflows and at the same time would give them water transportation for their crops and supplies. Other plans have been discussed to accomplish this purpose without going to the expense of the construction of locks, but have not yet taken shape.

In view of these conditions, the Atchafalaya Basin Levee Board has determined to enlarge as great a length as possible of their levee line on Bayou Lafourche with a minimum of expense, and with that purpose has carried on most of its work on that stream with dredges, thus enabling them to enlarge these levees with earth taken from the bed of the bayou. This system has had the advantage of diminishing the number of new levees required, and of substituting in their stead the enlargement of the present levees, thereby saving the abandonment of the large amount of earthwork in the existing line.

During the last two years the Board of Commissioners of the Atchafalaya Basin Levee District has availed itself of the provisions of Article 239 of the Constitution of 1898, and of Act 14 of the General Assembly of 1898, in order to refund its bonds outstanding and becoming due in October, 1900. They are thus prepared to retire $850,000 of their 6 per cent. bonds due in October by funding them with 5 per cent. bonds, the exchange being made by placing their new bonds at 107, while they retire their old bonds at par. This will add to the resources of this levee district a very large sum of money to be expended on the betterment of its levee system.

*Cat Island Levee District.* This district, as stated in our last report, "remains, as heretofore, a levee district only in name. No work has ever been undertaken by the district; and, considering the difficulties that must be dealt with in any attempt to protect it against overflow from high water of the Mississippi River, without at the same time subjecting it to partial inundation from rain water, seepage water and drainage from the hills, together with the large cost that would be involved as compared with the possible revenues, it is not probable that any movement will be made to construct levees there for many years to come."

*Pontchartrain Levee District.* During the last two years this district has confined itself mostly to general repair and maintenance of its one hundred and twenty-six miles of levee line, which protect the alluvial lands on the left bank of the Mississippi between the cities of Baton Rouge and New Orleans. The length of levee line by parishes from most recent surveys is as follows:

| | | |
|---|---|---|
| East Baton Rouge | 14.01 | miles. |
| Iberville | 26.62 | " |
| Ascension | 18.92 | " |
| St. James | 22.99 | " |
| St. John | 14.58 | " |
| St. Charles | 16.90 | " |
| Jefferson | 11.54 | " |
| Total | 125.56 | miles. |

The enlargement of levees in East Baton Rouge and Iberville parishes to standard grades and sections has been continued by the United States Engineers in the past two years, and the greater portion of this work is done. The State has completed the Margaret new levee in Iberville Parish, the Southwood and Waterloo levee enlargement in Ascension Parish, and the Bonnet Carre levee enlargement in St. John Parish.

The District has completed the "Upper District Protection Levee" in East Baton Rouge Parish, the enlargement of St. Gabriel Lane, Bagatelle and Arizona to Revenue levees in Iberville Parish, the enlargement of Nita, Belmont and St. Elmo levees in St. James Parish, the repairs of New Hope levee in St. John Parish, the enlargement of Hermitage, Good Hope and Sarpy levees and the repair of Good Hope levee in St. Charles Parish, and the cutting of weeds, the drainage of sloughs, ponds and barrow pits, and minor repairs of levees from College Point, St. James Parish, to the lower end of the district.

In the enlargement of levees by the State and District, the grade of the work was placed only two feet above the highest water recorded (1897) with a view of covering a greater length of line than would have been possible with the provisional standard adopted by the Mississippi River Commission in 1898.

The present height of the levee line with reference to the highest water plane (1897) stands as follows:

| NAME OF PARISH. | Up to and one foot above H. W. 1897. | One to two feet above H W. 1897. | Two to three feet above H. W. 1897. | Three feet or more above H. W. 1897. |
|---|---|---|---|---|
| | LENGTH IN FEET. | | | |
| East Baton Rouge... | 4,700 | ..... | ..... ..... | 69.000 |
| Iberville..... | 34,100 | 22,100 | 28,400 | 56,400 |
| Ascension ..... ..... | 51,300 | 11,800 | 35,100 | 1,700 |
| St. James..... | 23,300 | 77,100 | 21,400 | ..... |
| St. John..... | 15 700 | 43,600 | 7,800 | 11,500 |
| St. Charles..... | 11,100 | 46,300 | 16,100 | 14,900 |
| Jefferson..... | 4,900 | 38,300 | ..... | 15,900 |
| Totals ..... | 145,100 =27.5 miles | 239,200 =45.3 miles | 108,800 =20.6 miles | 169,400 =32.1 miles |

It is estimated (see Appendix C for statement) that it will require upwards of 4,000,000 cubic yards of earthwork to continue the raising and enlargement of the levees in this district to the Mississippi Commission grade, which is 4.6 feet above high water, 1897, at Baton Rouge, and 3.3 feet above high water, 1897, at Parish line of Jefferson and Orleans, and to rebuild new levees at points where the present line of old levee is threatened by caving banks, with a crown of 8 feet, and slopes of 3 and 3 to 1.

The amount and cost of levee work done in the district during the past two years by the district, the State and the United States, is approximately as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the District ..... | 0 04 | 1.36 | 29,159 | $5,520 26 |
| By the State ..... | 0.42 | 2.61 | 160,980 | 31,846 42 |
| By the United States ..... | ..... | 14.39 | 769,562 | 100,949 32 |
| Totals ..... | 0.46 | 18.36 | 959,701 | $138,316 00 |

*Lafourche Basin Levee District.* In this district the levee work undertaken by the State and district for the past two years has been the building of 3.86 miles of new levee and the enlargement of 2.59 miles of existing levee on the Mississippi River (its eastern boundary), amounting to 502,995 cubic yards, and at a cost of $77,234.75; and the building of 11.27 miles of new levee, and the enlargement of 5.53 miles of existing levees

on Bayou Lafourche (its western boundary), amounting to 1,222,012 cubic yards, and at a cost of $186,545.57.

During the same period the United States also undertook the following amount of levee work in this district on the Mississippi River, viz: 17.36 miles of enlargement, amounting to 632,532 cubic yards, and costing about $83,773.85.

The district has also expended in minor repairs, such as cutting out and refilling crawfish holes, restoring wave-wash, draining sloughs, ponds and barrow pits, in the construction and repair of revetments and the mowing of weeds, some $25,610.04.

The length of levee line on the Mississippi River (its eastern boundary), by parishes, from the most recent surveys, is about as follows:

| | | | | |
|---|---|---|---|---|
| Ascension..... | 6.99 miles | | | |
| St. James..... | 21.61 " | | | |
| St. John..... | 14.84 " | | | |
| St. Charles..... | 18.08 " | | | |
| Jefferson..... | 20.06 " | above New Orleans... | | 81.58 |
| Plaquemines... | 37.80 " | below " " ... | | 37.80 |
| Total..... | 119.38 " | | | 119.38 |

The present height of this levee line with reference to the high water plane (1897), stands as follows:

| NAME OF PARISH. | Up to and one foot above H. W. 1897. | One to two feet above H. W. 1897. | Two to three feet above H. W. 1897. | Three feet and more above H. W. 1897. |
|---|---|---|---|---|
| | LENGTH IN FEET. | | | |
| Ascension..... | ..... | 24,400 | 7,000 | 6,000 |
| St. James..... | 2,300 | 48,000 | 57,000 | 6,200 |
| St. John..... | ..... | 10,450 | 34,000 | 33,850 |
| St. Charles..... | ..... | 8,400 | 15,000 | 72,800 |
| Jefferson..... | 14,400 | 11,500 | 34,600 | 45,500 |
| Plaquemines..... | ..... | 74,700 | 84,200 | 40,100 |
| Totals..... | 16,700 =3.16 miles | 177,450 =33.60 miles | 231,800 =43.90 miles | 204,450 =38.72 miles |

The length of levee line on Bayou Lafourche (its western boundary), by parishes, is as follows:

| | |
|---|---|
| Ascension..... | 4.35 miles. |
| Assumption..... | 22.72 " |
| Lafourche..... | 47.00 " |
| Total..... | 74.07 miles. |

The present height of the levee line on Bayou Lafourche, with reference to the highest water plane on record, stands as follows:

| NAME OF PARISH. | Up to and one foot above. | One to two feet above. | Two to three feet above. | YEAR. |
|---|---|---|---|---|
| | LENGTH IN FEET. | | | |
| Ascension | 2,990 | | 20,000 | 1897 |
| Assumption | 69,083 | 8,300 | 42,600 | 1897 |
| Upper Lafourche. | 33,027 | 78,870 | 1,500 | 1897 |
| Lower Lafourche | 26,445 | 92,045 | 16,860 | 1899 |
| Totals | 131,545 =24.91 miles | 179,215 =33.94 miles | 80,960 =15.33 miles | |

In Lafourche Parish the high water planes of 1897 and 1899 intersected about four miles above Raceland.

At Raceland, and for fifteen miles below Lockport, the high water plane of 1899 exceeded that of 1897 by about two-tenths of a foot.

It is estimated (see Appendix C for statement) that it will take upwards of 1,881,000 cubic yards of earthwork to continue the raising and enlargement of the levees on the Mississippi River in this district to the Mississippi River Commission grade (which is 4.2 feet above high water of 1897 at Donaldsonville, and 3.0 feet above high water of 1897 at Riceland), and to rebuild new levees at points where the present line of old levee is threatened by caving banks, with a crown of 8 feet and slopes of 3 and 3 to 1.

To raise and enlarge the existing line of levees on Bayou Lafourche, from Donaldsonville to Thibodeaux, as far as recent surveys extend, and to replace old levees by new levees, where the banks are too steep to permit enlargement to a grade of three feet above the high water plane of 1897, with crown 8 feet and slopes of 3 and 3 to 1, will take upwards of 866,700 cubic yards of earthwork.

There was one crevasse on Bayou Lafourche in this district, at the upper end of Clotilda plantation, some five miles below Raceland, which occurred on April 23d, 1899, when the water in the bayou along this stretch was higher by about two-tenths of a foot than at any previous stage.

*Orleans Levee District.* Mr. Gervais Lombard, Engineer of this district, has kindly furnished us with a tabulated statement of the work done by the Board of Commissioners from April 20, 1898, to April 20, 1900 (for which see Appendix A), and with the following information relative to the length, grade and cost of levees and revetments:

"The length of levee line in the Orleans Levee District, on the right bank of the Mississippi River, is 13.88 miles; left bank, Mississippi River, 12.61 miles; interior and rear levees, 48 miles, making a grand total of 74½ miles. Thirty-two miles of the rear and interior levees have already been constructed and enlarged to a standard of 7 feet above mean gulf level, leaving 16 miles below grade or not yet constructed. The presence of Metairie Ridge, which has till now acted as a natural rear protection, has, in a measure, militated against the early completion of the 'Rear Levee System,' but now that the New Orleans Drainage Commission has completed two of the pumping stations outside of Metairie Ridge, and the completion of the rear levee system is all that stands in the way of reclamation of thousands of acres of land right in the heart of our great city, it is but natural that the system should be completed in the very near future.

"The grade of the levees on the Mississippi River, compared with the high water of 1897, is as follows:

"Five and a half miles is 4 feet above, 10½ miles is 3 feet above, 5½ miles is 2 feet above, 3⅛ miles is 1 foot above and 2¼ miles is at the same level, or below high water of 1897.

"As will be seen from the accompanying table, 1.23 miles of new levee and 1.08 miles of enlargement, amounting in all to 156,446.5 cubic yards, has been constructed in the last two years, at a total cost of $24,141.02. The total length of revetment built in the same time was 2½ miles, at a cost of $27,233.97, and the total length of skeleton wharf (pile bank protection work) in the Third District, constructed since April 20, 1898, is 9,320 lin. feet, at a cost of $136,193.37; 3,130 feet of this bank protection work is new work which joined the old work at the upper line of Ursuline Convent and extends down stream to Egania street, while 1,200 feet went towards replacing what was destroyed by the France street cave. The balance, 4,990 lin. feet, is reinforcement on the outer and inner sides of the first work that was done, and which had shown signs of weakness."

*Lake Borgne Basin Levee District.* The District Levee Board has expended, during the past two years, $22,698.69 in repair work, such as cutting out and refilling crawfish holes, restoring wave-wash, draining sloughs, ponds and barrow pits, in the construction and repair of revetments and the mowing and weeding of levees.

The levee work undertaken by the State for the past two years has been the construction of new levees at Poverty Point, St. Sophie and Harlem, and the raising and enlargement of Caernarvon, Orange Grove, Poverty Point, St. Sophie and Harlem levees, in Plaquemines Parish, amounting to 65,273 cubic yards of earthwork, at a cost of $9,270.37.

The United States has built 0.10 miles of new levee and 9.86 miles of enlargement of existing levees, amounting to 327,909 cubic yards of earthwork, at a cost of $52,656.47.

The line extends from the upper end of the Parish of St. Bernard to the lower line of Bohemia Plantation, in Plaquemines Parish, and its length, from the most recent surveys, is as follows:

| | | |
|---|---|---|
| St. Bernard Parish | 10.69 | miles. |
| Plaquemines Parish | 37.31 | " |
| | | " |
| Total | 48.00 | " |

The present height of the levee line, with reference to the highest water plane (1897), stands as follows:

| NAME OF PARISH. | One to two feet above H. W. 1897 | Two to three feet above H. W. 1897 | Three feet and more above H. W. 1897 |
|---|---|---|---|
| | LENGTH IN FEET. | | |
| St. Bernard | 11,800 | 3,200 | 40,900 |
| Plaquemines | 44,200 | 90,000 | 63,500 |
| Totals | 56,000 =10.60 miles | 93,200 =17.64 miles | 104,400 =19.76 miles |

It is estimated (see Appendix C for statement) that it will take upwards of 539,500 cubic yards of earthwork to continue the raising and enlargement of the levees in this district to the Mississippi River Commission grade, which is 3.2 feet above high water, 1897, at the upper boundary of St. Bernard Parish, and 3.0 feet above high water of 1897, at the lower line of

Bohemia Plantation, in Plaquemines Parish (the lower boundary of the district), and to rebuild new levees at points where the present line is threatened by caving banks, with a crown of 8 feet and slopes of 3 and 3 to 1.

*Grand Prairie Levee District.* This district, created by Act No. 24, of 1898, consists of that portion of the alluvial territory contained within the Parish of Plaquemines, beginning at the lower line of Bohemia Plantation and extending to the upper line of the United States Reservation for Fort St. Philip. The length of the existing levee line is about 23.65 miles. Commissioners were appointed, organizing as a Board on August 6th, 1898, when a report was submitted (see Appendix D) giving an approximate estimate in detail of nearly half a million cubic yards required to build, raise and enlarge the levees on the river front.

The act creating the district also gives the Board authority to create a system and establish a line of back levees for the said district. An effort in this direction was made by the Board on February 6th, 1899, at which time proposals for the building of a line of back levee were received. Only two bids were received, one for $1,989.00 per mile, and the other for $2,350.00 per mile, both of which were rejected, it being concluded that the resources of the district did not permit the Board to entertain the construction of the levee at that time.

The flood of 1897, previous to the organization of the district, having breached and destroyed the levees in many places, and overflowed the territory to such an extent as to materially affect the resources of the district, it has not been able, thus far, to do much more than build, enlarge and repair its levee line on the river front, and that only to a grade of about 1 to 1½ feet above the high water plane of 1897, with crown 4 feet and slopes of 2 and 3 to 1.

The district has expended since its organization up to date, $10,282.50, as follows:

| | |
|---|---|
| For repair work, weed cutting, etc..... | $3,648 68 |
| For revetment or other protection work..... | 4,521 44 |
| High water protection work 1899..... ..... | 2,112 30 |
| Total..... | $10,282 50 |

The amount and cost of the levee work done in the district since its organization up to date, by the District, the State and the United States, is approximately as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged. | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the District | 5.16 | ..... | 64 721 | $8,603 56 |
| By the State | 3.05 | 0.57 | 62,829 | 7,715 24 |
| By the United States | ..... | 1.00 | 33,745 | 4,731 83 |
| Totals | 8.21 | 1.57 | 161.295 | $21,050 63 |

During the high water of 1899 there were three crevasses in the district, one at Taboney's, one mile below the upper end of the district; one at Natulich, just above Natulich Canal, and one at Ferris, one-quarter of a mile above Hack's Bayou. Efforts were made to close these breaks, but subsequently abandoned for the want of material, the damages were so slight as not to warrant a further expenditure of funds to completely close them.

It is estimated (see Appendix C for statement) that it will take upwards of 431,000 cubic yards of earthwork to raise and enlarge the levees in this district to the Mississippi River Commission grade, which is 3 feet above high water of 1897, and to rebuild new levees at points where the present line of old levee is threatened by caving banks, with a crown of 8 feet and slopes of 3 and 3 to 1.

*Buras Levee District.* The District Levee Board reports expenditures during the past two years of $16,443.02, as follows:

| | |
|---|---|
| For repair work, weed cutting, etc | $4,538 06 |
| For revetment or other protection work | 11,564 56 |
| High water protection work, 1899 | 341 30 |
| Total | $16,443 92 |

The present height of the levee line, with reference to the highest water plane (1897), stands as follows:

| NAME OF PARISH. | Up to and one foot above H. W. 1897. | One to two feet above H. W. 1897. | Two to three feet above H. W. 1897. |
|---|---|---|---|
| | LENGTH IN FEET. | | |
| Plaquemines | 44,100 =8.35 miles | 49,600 =9.39 miles | 84,700 =16.04 miles |

It is estimated (see Appendix C for statement) that it will take upwards of 277,000 cubic yards of earthwork to continue the raising and enlargement of the levees in the district to the Mississippi River Commission grade, which is 3 feet above high water of 1897 at the lower line of Riceland Plantation (the upper boundary of the district) and 2.5 feet above high water of 1897 at the Jump, the lower boundary of the district, and to rebuild new levees at points where the present line of old levee is threatened by caving banks, with a crown of 8 feet and slopes of 3 and 3 to 1.

The amount and cost of levee work done in the district during the past two years by the district, the State and the United States, is approximately as follows:

| WORK DONE. | Miles of New Levee Built. | Miles of Levee Raised and Enlarged | Cubic Yards of Earthwork. | COST. |
|---|---|---|---|---|
| By the District | 0.08 | 0.10 | 3,747 | $416 15 |
| By the State | 1.10 | 2.83 | 63,696 | 8,322 09 |
| By the United States | 2.20 | 4.06 | 181,146 | 24,874 62 |
| Totals | 3.38 | 6.99 | 248,589 | $33,612 86 |

*Caddo Levee District.* The work undertaken in the past two years is as follows: By the District, nothing; by the State, new levee, 4.50 miles, enlargement, 3.39 miles, amounting to 340,442 cubic yards, costing $34,119.30; by the United States, new levee, 3.83 miles, amounting to 498,911 cubic yards, costing $93,767.72.

This represents a total of 8.33 miles of new levee, 3.39 miles of enlargement, and 839,353 cubic yards of earthwork, costing $127,887.02. The United States also contributed $2,195.80 towards the construction of the embankment across Tones Bayou; that is, paid five (5) cents per cubic yard on 43,916 cubic yards contained in said work, in addition to the sum paid by the State.

All of this work has been completed, except that on the Soda Fountain and Eyric places, where about 67,403 cubic yards of earthwork remains, at the date of this report, to be placed in position.

The district expended $1,196.92 in some minor repairs, weed cutting, etc.

The general condition of the line of public levee in the Caddo Levee District, so far built and improved, continues fairly good, though complaint has still to be made of the abuses to which the levees are in many places subjected.

Much levee work is still required in the district to close the gaps yet remaining in the line above Shreveport, and, in certain localities, to improve the grade and section of the existing line.

The district has, so far, been singularly fortunate in having suffered but little from caving banks. This good fortune cannot be expected to continue, and provision for new levees to cover breaches caused by such caving will be required sooner or later.

*Bossier Levee District.* The work undertaken in the past two years, is as follows: By the District, new levee, 1.58 miles, amounting to 119,140 cubic yards, costing $15,726.48; by the State, new levee, 5.41 miles, enlargement, 0.75 miles, amounting to 216,644 cubic yards, costing $20,110.83.

This represents a total of 6.99 miles of new levee, 0.75 miles of enlargement and 335,784 cubic yards of earthwork, costing $35,837.31. All of this work has been completed, except that at Dillard's and at Bear Point, of which about 64,000 cubic yards of earthwork still remains to be placed in position. The district also incurred some expense in minor repairs, weed cutting, etc., the exact amount of which we have not been able to ascertain. The United States did no work in the Bossier Levee District during this period.

The general condition of the existing line of levee in the district is good, though many parts of it have been seriously disfigured and reduced in section by abuses, which, unless checked and remedied, must eventually cause disaster.

Considerable levee work is yet required to complete the line of public levee in the Bossier Levee District. Quite an amount of additional work will also be required in the near future to build new levees where the present line is being gradually approached by caving banks.

*Red River, Atchafalaya and Bayou Bœuf Levee District.* The work undertaken in this district, during the past two years, is as follows: By the District, new levee, 5.46 miles; enlargement,

0.09 miles, amounting to 209,307 cubic yards, costing $18,768.83; by the State, new levee, 4.27 miles; enlargement, 6.72 miles, amounting to 258,217 cubic yards, costing $32,928.47; by the United States, new levee, 1.89 miles, amounting to 66,445 cubic yards, costing $6,201.53. This represents a total of 11.62 miles of new levee, 6.81 miles of enlargement, and 533,969 cubic yards of earthwork, costing $57,898.83. All of this work has been completed.

The district also expended $13,243.00 in improving drainage through Bayou du Lac, and $741.22 in weed cutting and salaries of inspectors, and the United States, $2,547.00 in repairing and regrassing the Choctaw Bayou Levee, in consequence of the injuries inflicted upon it by heavy and continuous rainfalls shortly after its completion.

The line of public levee, in this district, on Red River, is now continuous from the highlands, about one and a half miles above Alexandria, on Bayou Rapides, down Bayou Rapides to its junction with Red River, and thence down Red River to the Avoyelles Prairies, at David's Ferry. All of this line is generally in good condition.

The levee line on Bayou des Glaizes has been much improved during the past two years, but still needs extensive additions to its length, grade and section.

The line on the Atchafalaya River has been improved only at such points as were left in a precarious condition after the high water of 1897, and still requires much work to be done upon it to bring it up to a safe grade, while the extension of the line below Melville becomes more imperative each year.

Besides the work of levee building, to protect the district from inundation, this district is expected, under the authority given it by law, to do such drainage work as may be rendered necessary by reason of the extension of the lines of levee across channels otherwise affording natural drainage.

In this way the district, in 1892 and 1894, was called upon to do certain canal work in Avoyelles Parish, in consequence of the permanent closure of Mill Bayou, which previously discharged, by means of a culvert, through the then existing embankment across Mill Bayou, into Bayou des Glaizes; and, within the past year, to improve the drainage through Bayou du Lac,

on account of the closure of Choctaw Bayou, previously discharging into Red River.

The culvert at Mill Bayou afforded general satisfaction for a great number of years, but finally, in 1890, as is inevitable with most of such structures built in connection with earthen embankments, it became undermined from leakage, collapsed, and caused the levee through which it had been built to crumble.

The district, at the time, had no recourse under the law but to rebuild the embankment, without a culvert; and, with the advice of the Board of State Engineers, did so, thus depriving the area known as Big Bend of its usual relief during low stages of Bayou des Glaizes from accumulated rain water.

To remedy this condition a canal was dug in 1892 from Mill Bayou to the slough at the Cut-off Road, which afforded material relief to many, but not the general relief hoped for. It was, however, all that the district could, with its limited means, do at that time.

This canal was afterwards enlarged, but the absence of means again limited its dimensions, and it is still inadequate to the service required of it, and will so continue until properly enlarged and extended.

Previous to the closure of Choctaw Bayou, which was done in compliance with the continued urgent appeals of a large number of property owners, to obtain protection against inundation from Red River, during periods of high water, to a large extent of territory in the basin, below Alexandria, usually known as the "Choctaw Swamp," lying between Red River, Bayous Robert and Bœuf and the Avoyelles Prairies. The drainage of this basin was previously partly through Choctaw Bayou, and partly through Bayou du Lac, Pearl Lake, and Little Bayou des Glaizes into Bayou des Glaizes proper, whenever flood conditions at the outlets to these channels permitted.

By the closure of Choctaw Bayou the outlet to the basin was reduced from the two channels above described to a single channel.

This change in condition, it was claimed, resulted, during the wet months following the completion of the levee at Choctaw Bayou, in an overflow, from rain water, in the lower portion of the basin, exceeding in depth and area any previously recorded from that source, though the injury resulting was not

found to have reached or seriously affected anything beyond the edges of a few small fields projecting into the swamps, and the wooded swamps themselves.

The district, then, in consideration of complaints from the localities claiming to be affected, undertook to give such relief as was possible with the limited means at its command.

The situation was, therefore, by request of the District Levee Board, carefully gone over by the Board of State Engineers, and, after quite an amount of exploration and levelling, it was recommended that the channel-way be improved through Bayou du Lac from Three Prong Lake to Lake Pearl, and, later on, through Lake Pearl and Little Bayou des Glaizes to Bayou des Glaizes proper.

To improve this channel, however, to an extent that would insure results commensurate with the additional task imposed upon it and satisfactory to all the interests concerned, called for the application of a sum of money beyond the immediate means of the district.

A modified project for improvement, following as nearly as possible the line first outlined, was then prepared at the request of the Board of Commissioners. Upon this project proposals were invited and received, but the lowest offer to execute this modified plan was $21,000.00, a sum still beyond the immediate means of the district.

A plan still further modifying its recommendations was, then, in conformity with the wishes of the Commissioners, prepared by the Board of State Engineers, and, after due advertisement, a contract involving an expenditure of $13,000.00, was, awarded for its execution.

The work prescribed under the contract was duly undertaken and completed, and, while the results attained are not such as the situation demands, the work now being performed by Bayou du Lac resulting from this limited improvement, has exceeded the expectations of its designers.

A popular belief has always existed, and still exists near the lower end of the basin, that the depression and partly abraided waterway across the Marksville Prairies, known as the Coulee des Grues, could be made to render effective service as an auxiliary outlet to the Choctaw Swamp basin by cutting a ditch or canal through it.

That the Coulee des Grues would, at times, if so treated, rapidly carry off a considerable part of the rain water in this basin is true, down to a certain level—that is, down to the elevation of the banks of Choctow Bayou and Bayou du Lac, below which it would have no effect upon conditions above but simply continue to drain the pond between the Marksville Prairies and Choctaw Bayou, as long as conditions in Old River, below the prairies, remained favorable.

However, this slight advantage gained to a limited area, would be offset by the great disadvantages that would arise to that and the larger territory still further above, in times of extreme floods in the Red and Mississippi Rivers, by opening up a new inlet to the latter, through which such floods would reach a stage in the swamps and on adjacent lands only about six feet lower than that which existed when Choctaw Bayou was open.

The fact of the matter is, that to afford adequate drainage to the territory lying below Alexandria, between Red River, Bayous Robert and Bœuf and the Avoyelles Prairies, is an undertaking of considerable magnitude, and will involve the expenditure of a large amount of money, and cannot be intelligently planned as a whole except on that basis.

With such examination as the Board of State Engineers has so far been able to give to the subject, and such information as it now possesses, there is no doubt in the minds of its members that the surplus rain water affecting this basin can be satisfactorily disposed of, and that a plan of operations embracing the following suggestions will prove satisfactory, viz:

(1). The closure of Bayou Lamourie, at or near its departure from Bayou Bœuf, or the control of the volume of water, flowing out of Bayou Bœuf into the Choctaw Swamp, through Bayou Lamourie.

(2) A canal or a succession of canals, properly located and designed, connecting natural waterways, from near Alexandria to Three Prong Lake.

(3) The enlargement and improvement of Bayou du Lac, from Three Prong Lake to Pearl Lake, or as much thereof as may be found to be necessary.

(4) The enlargement and improvement of "Little Bayou des Glaizes," from Pearl Lake to Bayou des Glaizes proper.

The only drawback to this plan might occur during periods

of extreme floods in the Red and Mississippi Rivers, when parts of the lower end of the basin would be temporarily affected by back water.

Later on this plan might be supplemented by the enlargement and improvement of Bayou Bœuf, say from Cheneyville to its junction with the Courtableau and by connecting the lower end of the basin with Bayou Bœuf, at some point below Cheneyville, to be determined by survey and observation, thus opening up a channel which could give no material return from river floods.

### STAGE OF THE RIVERS.

At the date of our report of April 20th, 1898, it was stated that the crest of the flood then passing the upper limit of the State indicated at Lake Providence nearly the same stage (misprinted 42.4 instead of 44.2) on that day as the highest of 1897. The highest stage of 1898 at Lake Providence was 44.35, on April 23d, while the highest stage there in 1897 was 44.54.

A few miles below Lake Providence, it is said, that the high water of 1898 was about 0.4 feet above that of 1897, but everywhere else in the State the high water of 1897 in the Mississippi River remains the highest of record.

The flood in the Mississippi of 1899, which passed through the State in the month of April, was still lower than that of 1898, at all points above New Orleans.

For the purpose of comparison the highest gauge readings in 1897, 1898 and 1899, at a number of stations on the Mississippi River, are given in the table below:

| STATION. | 1897. | 1898. | 1899. |
|---|---|---|---|
| Arkansas City | 51.90 | 51.14 | 48.60 |
| Greenville | 46.75 | 46.16 | 43.00 |
| Lake Providence | 44.54 | 44.35 | 41.65 |
| Vicksburg | 52.48 | 49.40 | 47.30 |
| St. Joseph | 47.85 | 45.10 | 43 25 |
| Natchez | 49.82 | 47.40 | 46.15 |
| Red River Landing | 50.20 | 44.30 | 43.30 |
| Baton Rouge | 40.65 | 34.60 | 33.70 |
| Donaldsonville | 32.75 | 27.95 | 27.50 |
| Carrollton | 19.17 | 15.90 | 16.00 |
| Fort Jackson | 7.20 | 6.70 | 7.00 |

During the period covered by this report (April 20, 1898, to April 20, 1900), there has been no flood in Red River of suffi-

cient height to put any considerable strain upon the levees protecting Louisiana.

The outlets from the rivers, have, of course, responded to all flood stages of the stream in which they originate; but it is worthy of note that in Bayou Lafourche the flood stages, 40 to 50 miles below, are always disproportionately high as compared with those at its head. Thus, in 1899, the flood stage at Donaldsonville (the head of Bayou Lafourche) was 5.25 feet lower than that of 1897; while at Raceland (50 miles below) the flood stage of 1899 was 0.2 feet higher than that of 1897.

On the Atchafalaya River a similar disproportion occurred; at Barbre's (at the head of the Atchafalaya) the highest stage of 1899 was 9.4 feet lower than that of 1897; but at Melville, about 29 miles below, it was only 2.7 feet lower.

During the flood season of 1898 no crevasses occurred on the Mississippi River, except a few small breaks in the fragmentary levees of the lower coast, in the section which has since then been incorporated as the Grand Prairie Levee District.

There were two crevasses in 1898 on Bayou Lafourche: (1) Melancon's, on the left bank, about a half mile below the "Cut-Off Canal," or 73 miles below Donaldsonville. It broke on April 19, and was noted in our last biennial report of April 20, 1898. It was in a levee about 8 feet high, and became 420 feet wide. It was caused by water rising above the top of the levee. (2) Guitreaux's, on the right bank, about a mile below Raceland, or 41 miles below Donaldsonville. It broke on April 27, and became about 260 feet wide. It was in a levee about 10 feet high, and was caused by waves from a severe windstorm cutting through the capping which had been added to the crown as the water rose.

During the flood season of 1899 there were four small crevasses in the levee districts of Louisiana: (1) Clotilda, on left bank of Bayou Lafourche, 5 miles below Raceland. It broke April 23d, and became about 700 feet wide. It was in a new levee about 12 feet high, and was caused by a leak underneath. (2) Taboney's, left bank Mississippi River, about a mile below the upper end of the Grand Prairie Levee District. It broke April 17th, and became about 175 feet wide. It was in a levee about 5 feet high, and was caused by the washing of waves. (3) Natulich's, in front of Natulich Canal, Grand Prairie Levee Dis

trict. It broke April 9th. It was a levee about 4 feet high and was caused by the washing of waves. (4) Ferris, about a quarter of a mile above Hack's Bayou, Grand Prairie Levee District. It broke April 14th, and became about 120 feet wide. It was in a levee about 4 feet high and was due to insufficient section of levee.

None of the crevasses above mentioned in 1898 and 1899 caused extensive overflow or damage. Their effects were extremely limited and local.

At this date (April 20, 1900), although some of the tributary streams are rising, none of them, so far as reported, indicate the early probability of any considerable flood in the Mississippi River. The highest stages reached thus far during the current year were in the latter part of March. The gauge reading at several points at that time, and also as reported by the Weather Bureau this day, are given below:

| STATION. | Date and Gauge Reading. | Gauge Reading April 20, 1900. |
|---|---|---|
| Cairo, Ill | March 17, 39.2 | 26.7 |
| Memphis, Tenn | March 20, 29.5 | 19.7 |
| Helena, Ark | March 22, 38.1 | 28.0 |
| Vicksburg, Miss | March 27, 38.0 | 30.4 |
| New Orleans, La | March 30, 14.0 | 13.2 |

The record of high water stages at places where regular gauges have been kept, published with our last biennial report, has proved so generally convenient for reference that we have had it revised, brought down to date, and reprinted in this report as Appendix G.

LEVEE GRADES.

In our biennial report of April 20, 1898, it was stated, under the above head, that "most of the levees on the Mississippi, below Donaldsonville, built or enlarged by the State and the levee districts, during the past two years, have had grades practically identical with those provisionally adopted by the Mississippi River Commission, viz: Three feet above the high water of 1893 at the lower end of the levee system (at 'The Jump'), and thence increasing to 4 feet above the high water of 1893 at New Orleans, and to 5 feet at Donaldsonville. Above Donaldsonville it was not considered practicable, with the means likely

to become available in the near future, to increase the grade of the levees beyond 5 feet above high water of 1893. This tentative standard for levee grades has been adhered to, except that, since the flood of 1897, it has been thought proper to fix the grades between the Arkansas line and Donaldsonville at 3 feet above the high water of the latter year wherever this was higher than 5 feet above that of the former year.

"It is not presumed that these grades will prove sufficient along all parts of the levee line for any flood that may occur; though it is believed that below Donaldsonville they may be found to afford some margin of safety above any flood not high enough to overtop the levees in the upper part of the State, so long as the grade of the last named levees is not increased several feet beyond the standard above described.

"On Red River it has only been attempted, thus far, to put the levees which have been built or enlarged from time to time, up to a grade of about 3 feet above the highest waters previously known. When the existing levee lines have been further tested by experience, and when they have been extended and made more nearly continuous, some closer approach to a proper final standard of grade should become possible.

"On Bayou des Glaizes no general grade has ever been fixed, the proportion of most of the levee work done there having been dependent upon the means available at the time it was undertaken, and the grade varying from 1 to 3 feet above the highest previous waters.

"The levees of the Atchafalaya River on the right bank — that is, in the Red River, Atchafalaya and Bayou Bœuf Levee District — have had their grades fixed only in the same manner as above described for those of the Red River; but on the left bank, a provisional standard has been adopted for the levees of the Atchafalaya Basin Levee District which stands 3 feet above the highest water, that of 1897. There is no reason to doubt that grades higher than these will ultimately be found necessary on both sides of the Atchafalaya.

"On Bayou Lafourche the grade now used for levee work in the Atchafalaya Basin Levee District (right bank) is generally 3 feet above 1897 above Lafourche Crossing, and 2½ feet above the same water below said point; while, by a recent resolution of the Board of Commissioners of the Lafourche Basin Levee

District, the grade of levee work on the left bank is fixed at 1½ feet above high water of 1897 at Lockport, thence increasing to 2½ feet at Thibodaux and to 3 feet at Donaldsonville. The grade of levees on Bayou Lafourche has been continually increased, especially towards the lower end of the system, only to find that along this portion of the bayou the water has risen higher and higher until, in most flood seasons, it has broken through or over the levees. Under these circumstances the maintenance of levees below Lockport — or even below Thibodaux — is becoming almost an intolerable burden, and the people living along the bayou are now more generally in favor of closing the bayou at its head than formerly. This appears the only practicable measure of relief; and if a lock were placed at Donaldsonville to admit boats from the Mississippi River, navigation might be improved, and the levee problem disposed of so far as it concerns the bayou.

"It should, of course, be understood that the grades for levees above described for the several streams of the State have not yet been reached in any general way by the work accomplished thus far, but that they only represent the stage of improvement to which the endeavors of the State and levee districts are now being directed, wherever means appear available for its attainment. Much of the levee work of the United States on the Mississippi River, above Donaldsonville, has been built to higher grades than the State or the levee districts have been able to undertake."

The above statement so nearly applies to the levee work of the past two years and to the present situation that we have quoted it in full, though it should be noted that the levee work actually done during this period has not always conformed as closely to the grades above described as would have been desirable, it having been deemed necessary in many cases to curtail the amount of work in order to make the means available cover as great a length of line as possible.

But, as a matter of fact, the actual grades of the levees have been very much improved, and at this time there are very few places where they are not somewhat above the level of the highest recorded flood stages.

In Appendix C will be found tabular statements relative to the height of levees in Louisiana, on the Mississippi River, above

the high water of 1897 (which is generally the highest of record), from which it may be seen that out of nearly 700 miles of Mississippi River levees, in the levee districts of Louisiana (not including the Orleans Levee District), it is estimated that there are only about 30 miles that stand less than 1 foot above the high water of 1897; and it may be noted that nearly half of this low grade levee is in the more recently created levee districts in the lower end of the State, that is, in the Buras and Grand Prairie Levee Districts.

These tables also present an approximate estimate of the earthwork required to raise and enlarge the existing line of levees on the Mississippi River to certain grades, and to build new levees at points where, on account of caving banks, it now appears probable that such new levees may become necessary within the next two years.

The grades used in preparing these estimates, below the mouth of Red River, are those approved by the Mississippi River Commission in 1898, as described in the tables referred to; but above the mouth of Red River, the grade to which the estimates given in the tables is referred, is only 3 feet above the high water of 1897.

The total quantity of earthwork required, according to these estimates, is 11,735,000 cubic yards for raising and enlarging the existing line of levees, and 10,039,000 cubic yards for new levees that may be required within the next two years.

## BAYOU LAFOURCHE LOCK.

At a joint meeting of the Atchafalaya and Lafourche Basin Levee Boards, called by your Excellency at Baton Rouge, on May 21, 1899, to consider the best means of preventing overflow from Bayou Lafourche, resolutions were adopted favoring the execution of the project adopted by Congress in 1888 for the improvement of Bayou Lafourche by dredging and the construction of a lock at Donaldsonville.

It was shown that since 1890, more than a million dollars had been expended by the State and the levee districts on the enlargement and maintenance of the levees on the bayou; that many years of expenditure at the same rate would be required before the levees could be so improved as to make them reasonably secure, and that the building of a suitable lock at the head

of the bayou would not only improve its navigation, but prevent the necessity for further expenditure for levees on the bayou, thus permitting the application of the levee funds of the State and districts to the betterment of levees on the Mississippi River. The resolutions pledge the levee organizations interested to so apply their funds whenever the United States constructs the lock. A copy of these resolutions and a copy of resolutions passed at the Convention held at Memphis, in November, 1889, on "Improvement of Western Waterways," will be found in Appendix E.

A special report to the Commissioners of the Atchafalaya Basin Levee District, dated October 27, 1894, published on page 98 of our biennial report of April 20, 1896, may also be referred to.

NEW BASIN CANAL AND SHELL ROAD.

The Board of Control of the New Basin Canal and Shell Road has steadily kept up the improvement of this piece of State property during the past two years. It completed the construction of the revetment work between the New Orleans & Western Railroad bridge and Carrollton avenue, which it had placed under contract at the date of our last report, April 20, 1898. In addition to this, they have in contemplation the widening and deepening of the mouth of the canal to a width of not less than 125 feet and a depth of not less than 8 feet. With this end in view the Board of State Engineers, at the request of the Board of Control, has prepared plans and specifications for this work. These improvements are now under consideration by the Board of Control.

Moreover, owing to the steady encroachment of the canal upon the shell road between the New Orleans & Western Railroad bridge and West End, it has become necessary to build some protection work or revetment to preserve the bank of the canal and the full width of the shell road. The Board of Control has, therefore, placed under contract the construction of some 12,000 feet of revetment to cover this stretch and protect it from further encroachment. At their request, plans and specifications for this work were also prepared by the Board of State Engineers.

In accordance with Act 82 of the Legislature, session of 1896, the drainage opening into the New Basin Canal, known as

the "Louque Cut," which poured into the canal the drainage of a section of the city of New Orleans, has been closed.

Altogether, the New Basin Canal and Shell Road property is in a very good condition, and further improvements are in contemplation by the Board of Control.

## CONVICT LABOR.

Article 196, of the Constitution of 1898, requires the enactment of laws, at the coming session of the General Assembly, for the employment of convicts, after the expiration of the present penitentiary lease, in March, 1901, "on public roads or other public works, or on convict farms or in manufactories owned or controlled by the State."

The experience of the past thirty years has shown that an efficient force of levee laborers can be formed from the able-bodied convicts of the State, and that under competent superintendence their work may be advantageously utilized in the construction and enlargement of levees. The product of their labor, however, is not equal to that of the same number of free laborers, and the total amount of earthwork the existing convict force can do, in any one year, is not more than 15 per cent. of the average quantity annually required for the maintenance and improvement of the levee system of the State.

Although they cannot be relied upon to supply a sufficient amount of labor for the levee work necessary in the State, it would appear wise, in framing laws for the control of the penitentiary, to give the officers charged with its maintenance authority to bid on levees or other public works, for which proposals are advertised, on the same terms and conditions as other bidders, and to enter into contracts for such works in the same manner as other contractors. This would not give convict labor any preference over free labor, nor hamper the management of the penitentiary in conducting its affairs in such manner as may be deemed best or most advantageous to the State.

## PUBLIC ROADS.

The construction and maintenance of public roads in Louisiana has never received the attention its importance should demand. Of the many thousands of miles of highways throughout the State, there are certainly not many miles which are not in

need of improvement, or even such as can be considered good, common roads, outside of a few towns and cities.

The scarcity of suitable materials for making a firm road bed or a good road surface, and the excessive work requisite to secure proper drainage in a large part of the State, especially in the alluvial region, render it more difficult to build good roads in Louisiana than in almost any other State. But no one can doubt that by systematic care and timely attention it is entirely practicable to greatly improve the condition of our common earthen roads, and thus save to the producers of agricultural products some part of the immense cost of hauling them to shipping points, and to avoid some of the delays and discomforts of travel on the public roads. It should also be possible, without burdensome expense in some parts of the State where stone and gravel are available, to build better roads than can be made with earth alone.

The United States Department of Agriculture, in Circular No. 19, issued by the office of Road Inquiry, April 4, 1896, estimated the average cost of hauling one ton of the crops of the country from the farm to the shipping point, at 25 cents per mile, and the average length of haul at a little over 12 miles.

It seems probable that the cost per ton of hauling over the common roads is more per mile in Louisiana than the average in the entire United States, though the average distance hauled is possibly less. If so, it appears reasonable to let the greater cost per mile offset the shorter distance hauled, and to accept 25 cents per ton per mile as a probable average cost, and say 12 miles as an average haul, that is, an average cost of $3.00 per ton for hauling from the farm to the point of shipment.

The staple products of the State, sugar and molasses, cotton, cotton seed and rice, amount to at least 920,000 tons per annum. Adding to this the weight of other products raised for market, with return freights, building materials, etc., it cannot appear an extravagant estimate to put the total weight of farm and plantation products and supplies hauled over the public roads of Louisiana at as much as 2,000,000 tons per annum. At $3.00 per ton, as above estimated, this would amount to the enormous sum of $6,000,000 per annum for moving the agricultural products of the State and the supplies necessary to make them,

upon the public roads. This is equal to a tax of 46 mills on the total assessed value of the country parishes.

Article 291, of the Constitution of 1898, gives the police juries power "to raise funds for the purpose of constructing, maintaining and repairing the public roads and bridges of their parishes," which should suffice for continual improvement of roads throughout the State.

In March, 1899, the Board of State Engineers addressed circulars to the presidents of police juries with a view to being prepared, if called on to do so, to give "such assistance and advice as will tend to create a uniform system of public roads throughout the State," as contemplated in Article 294 of the Constitution; and at a later date sent to all police juries in the State copies of a "Form of Specifications Suggested to be Embodied as a Section of Road Ordinance." We are not aware, however, to what extent, if any, this suggestion has been adopted. Copies of the circulars referred to will be found in Appendix E.

## APPENDICES.

The following appendices are presented as a part of this report, viz:

APPENDIX A.—Tabular statements relative to quantity, length and cost of levee work undertaken by the State of Louisiana, the several Boards of Levee Commissioners, and the United States, in Louisiana and a part of Arkansas, from April 20, 1898, to April 20, 1900.

APPENDIX B.—Tabular statement relative to the bond issues of the several levee districts, and the annual gross resources of the State and levee districts for levee purposes.

APPENDIX C.—Tabular statements relative to length and elevation above high water of existing levee line on the Mississippi River, in Louisiana, with estimates of earthwork required to raise and enlarge same, or to build new levees where necessary.

APPENDIX D.—Copies of certain reports and letters of the Board of State Engineers to the Boards of Levee Commissioners.

APPENDIX E.—Copies of sundry special reports to the Governor, letters addressed to the Mississippi River Commission, etc., and of resolutions relative to improvement of Bayou Lafourche.

APPENDIX F.—Copy of circulars to police juries, relative to public roads, etc.

APPENDIX G.—High water records, from 1872 to 1899, inclusive.

All of which is respectfully submitted,

THE BOARD OF STATE ENGINEERS.

HENRY B. RICHARDSON,
*Chief State Engineer.*
SIDNEY F. LEWIS,
H. BOL. THOMPSON,
FRANK M. KERR,
ARSENE PERRILLIAT,
*Assistant State Engineers.*

WALTER H. HOFFMAN,
*Secretary.*

# APPENDIX A.

**Tabular Statements Relative to Quantity, Length and Cost of Levee Work Undertaken by the State of Louisiana, the Several Boards of Levee Commissioners, and the United States, in Louisiana and a part of Arkansas, from April 20, 1898, to April 20, 1900.**

## APPENDIX A. STATEMENT

Levee work undertaken by the State of Louisiana in the several Levee
to April 20, 1900, with eight contracts of earlier

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| | | | FIFTH LOUISIANA LEVEE | | | |
| 1 | Cottonwood | East Carroll | Nov.12,1897 | June14,1898 | 6,032 | ..... |
| 2 | Longwood | East Carroll | Mar.26,1900 | ..... | 900 | ..... |
| 3 | Salem | East Carroll | Dec.12,1898 | Apr. 22,1899 | 3,500 | ..... |
| 4 | Delta to Young's Point | Madison | Aug.16,1897 | Dec. 22,1899 | 8,380 | 38,625 |
| 5 | Delta | Madison | Nov.14,1899 | Apr. 3,1900 | 3,264 | ..... |
| 6 | Inge Field | Tensas | Oct. 16,1899 | Feb. 5,1900 | 2,282 | ..... |
| | Totals | ..... | ..... | ..... | 19,358 | 38,625 |
| | Less amount done previ | ous to April 20, | 1898 | ..... | 4.845 | 29,654 |
| | Work done from April 20, | 1898, to April 20, | 1900 | ..... | 14,513 or2.75mls | 8,971 or1.70mls |
| | | | ATCHAFALAYA BASIN LEVEE | | | |
| 7 | Rosehill-Highland | W. Baton Rouge | Sep.26,1898 | Apr. 17,1899 | 4,160 | ..... |
| 8 | Belair to Homestead | W. Baton Rouge | Sep.14,1899 | Apr. 3,1900 | ..... | 15,162 |
| 9 | Australia | Iberville | Nov.10.1899 | ..... | 2,700 | 4,927 |
| | Totals | ..... | ..... | ..... | 6,860 or1.30mls | 20,089 or3.8 mls |
| | | | PONTCHARTRAIN LEVEE | | | |
| 10 | Margaret | Iberville | Nov. 5,1897 | Oct. 12,1898 | 3,642 | ..... |
| 11 | Southwood | Ascension | Nov.10,1899 | ..... | ..... | 16,498 |
| 12 | Bonnet Carre | St. John | Aug.16,1897 | Dec. 26,1898 | ..... | 3,050 |
| | Totals | ..... | ..... | ..... | 3,642 | 19,548 |
| | Less amount done previous to April | 20, 1898, and not compl | eted April 20, | 1900 ..... | 1,415 | 5,758 |
| | Work done from April 20, | 1898, to April 20, | 1900 | ..... | 2,227 or0.42mls | 13,790 or2.61mls |
| | | | LAFOURCHE BASIN LEVEE | | | |
| 13 | Cofield | Ascension | May 27,1899 | Apr. 3,1900 | 5,945 | ..... |
| 14 | Fairfield | Jefferson | May 12,1899 | Nov.25,1899 | 4,913 | .... ... |
| 15 | Noland | Ascension | Dec.15,1896 | Sep. 12,1898 | 678 | 12,086 |
| | Totals | ..... | ..... | ..... | 11,536 | 12,086 |
| | Less amount done previ | ous to April 20 | 1898 | .... ..... | 380 | 12,086 |
| | Work done from April 20, | 1898, to April 20, | 1900 | ..... | 11,156 or2.11mls | ..... ..... |
| | The above is divided by | streams as fol | lows: | | | |
| | On the Mississippi | River | ..... | ..... | 2.05mls | ..... |
| | On Bayou Lafour | che | .... ..... | ..... | 0.06mls | ..... |
| | Totals | ..... | ..... | ..... | 2.11mls | ... |

No. 1. STATE CONTRACTS.

Districts, under thirty-six contracts entered into from April 20, 1898, date, not completed April 20, 1898.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT | | | | |
| 161,458 | 14.21 | $22,943 18 | Mississippi Riv. | |
| 30,000 | 15.45 | 4,635 00 | Mississippi Riv. | |
| 122,654 | 19.21 | 23,561 83 | Mississippi Riv. | |
| 401,073 | 12.75 | 51,136 80 | Mississippi Riv. | |
| 86,548 | 13.74 | 11,891 69 | Mississippi Riv. | |
| 77,421 | 16.70 | 12,929 30 | Mississippi Riv. | |
| 879,154 | .... | $127,097 80 | | |
| 297,400 | ..... | 38,444 10 | | |
| 581,754 | ..... | $88,653 70 | | |
| ..... | ..... | ..... | ..... | Average price 15.24 cents per cubic yard |
| DISTRICT | | | | |
| 168,209 | 16 ⅔ | $26,725 47 | Mississippi Riv. | |
| 79,673 | 14.00 | 11,154 22 | Mississippi Riv. | |
| 42,801 | 14.00 | 5,992 14 | Mississippi Riv. | |
| 285,683 | ..... | $43,871 83 | | |
| ..... | ..... | ..... | ..... | Average price 15.36 cents per cubic yard |
| DISTRICT | | | | |
| 132,490 | 19 ⅝ | $26,001 16 | Mississippi Riv. | |
| 76,951 | 20.60 | 15,390 20 | Mississippi Riv. | |
| 39,193 | 19.75 | 7,740 61 | Mississippi Riv. | |
| 248,634 | ..... | $49,131 97 | | |
| 87,654 | ..... | 17,285 55 | | |
| 160,980 | ..... | $31,846 42 | | |
| .... | ..... | ..... | ..... | Average price 19.78 cents per cubic yard |
| DISTRICT | | | | |
| 147,408 | 13.43 | $19,796 89 | Mississippi Riv. | |
| 113,843 | 13.00 | 14,799 59 | Mississippi Riv. | |
| 96,122 | 12.40 | 11,919 12 | Bayou Lafourche.... | |
| 357,373 | ..... | $46,515 60 | | |
| 90,924 | ..... | 11,274 57 | | |
| 266,449 | ..... | $35,241 03 | | |
| ..... | ..... | ..... | ..... | Average price 13.23 cents per cubic yard |
| 261,251 | ..... | $34,596.48 | | |
| 5,198 | ..... | 644.55 | | |
| 266,449 | | $35,241.03 | | |

## APPENDIX A. STATEMENT

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| | | | **LAKE BORGNE BASIN LEVEE** | | | |
| 16 | Caernarvon and Orange Grove | Plaquemines | Nov. 9,1897 | Sep.16,1898 | ..... | 9,506 |
| 17 | St. Sophie and Poverty Point | Plaquemines | Oct. 17,1899 | Dec.15,1899 | 550 | 4,867 |
| 18 | St. Sophie and Harlem | Plaquemines | Nov. 9,1897 | Oct. 26,1899 | 1,120 | 4,980 |
| 19 | Harlem | Plaquemines | Oct 16,1899 | Feb. 3,1900 | 1,916 | ..... |
| | Totals | ..... | ..... | ..... | 3,586 | 19,353 |
| | Less amount done previous to April 20 | | 1898 | ..... | ..... | 10,429 |
| | Work done from April 20, 1898, to April 20, | | 1900 | ..... | 3,586 or0.67mls | 8,924 or1.69mls |
| | | | **GRAND PRAIRIE LEVEE** | | | |
| 20 | Section No. 1 | Plaquemines | Sep. 23,1898 | Feb. 22,1899 | 7,538 | 3,040 |
| 21 | Grand Prairie | Plaquemines | Sep. 13,1899 | Jan. 13,1900 | 8,607 | ..... |
| | Totals | ..... | ..... | ..... | 16,145 or3.05mls | 3,040 or0.57mls |
| | | | **BURAS LEVEE** | | | |
| 22 | Section No. 3 | Plaquemines | Oct. 21,1898 | Oct. 5, 1899 | 2,185 | 7,086 |
| 23 | Section No. 4 | Plaquemines | Oct. 21,1898 | Feb.27,1899 | 450 | ..... |
| 24 | Dr Booth | Plaquemines | Sep. 14,1899 | Dec. 15,1899 | ..... | 4,475 |
| 25 | Mrs. Gautier to N. Buras | Plaquemines | Sep. 14,1899 | Feb.19,1900 | ..... | 3,400 |
| 26 | Leovy | Plaquemines | Sep. 14,1899 | Feb.19,1900 | 3,188 | ..... |
| | Totals | ..... | ..... | ..... | 5,823 or1.10mls | 14,961 or2.83mls |
| | | | **CADDO LEVEE** | | | |
| 27 | Cairo | Caddo | Aug.11,1898 | Jan. 20,1899 | 7,678 | 2,371 |
| 28 | Cairo and Soda Fountain | Caddo | Dec. 15,1899 | ..... | 16,492 | 2,735 |
| 29 | Bayou Pierre Enlargement | Caddo | Nov.25,1898 | Nov. 7,1899 | 6,096 | 15,670 |
| | Totals | ..... | ..... | ..... | 30,266 | 20,776 |
| | Less amount not completed April 20, 1900 | | ..... | ..... | 6,500 | 2,835 |
| | Work done from April 20, 1898, to April 20, | | 1900 | ..... | 23,766 or4.50mls | 17,941 or3.39mls |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT | | | | |
| 44,374 | 19 ¾ | $8,768.86 | Mississippi Riv. | |
| 12,504 | 12 ½ | 1,563 00 | Mississippi Riv. | |
| 36,029 | 12 ½ | 4,503 62 | Mississippi Riv. | |
| 20,866 | 15 ¾ | 3,286 39 | Mississippi Riv. | |
| 113,773 | ..... | $18,116 87 | | |
| 48,500 | ..... | 8,846 50 | | |
| 65,273 | ..... | $9,270 37 | | |
| ..... | ... | .. | ..... | Average price 14.21 cents per cubic yard |
| DISTRICT | | | | |
| 33,097 | 11 ½ | $3,750 99 | Mississippi Riv. | |
| 29,732 | 13 ½ | 3,964 25 | Mississippi Riv. | |
| 62,829 | ..... | $7,715 24 | | |
| ..... | ..... | ... ..... | ..... | Average price 12.29 cents per cubic yard |
| DISTRICT | | | | |
| 31,996 | 12.98 | $4,153 08 | Mississippi Riv. | Includes work at Metcalf, Johnson, Popovich, Kamlah and Camm, Rosenbroch, Lauderbough, Perry to Zibilich and Collett. |
| 2,326 | 12.98 | 301 90 | Mississippi Riv. | |
| 10,801 | 13 ¼ | 1,443 05 | Mississippi Riv. | |
| 8,508 | 13 ¼ | 1,127 31 | Mississippi Riv. | |
| 9,975 | 13.00 | 1,296 75 | Mississippi Riv. | |
| 63,606 | ..... | $8,322 09 | | |
| ... . | . | ..... | ..... ..... ..... | Average price 13.06 cents per cubic yard |
| DISTRICT | | | | |
| 69,899 | 9.00 | $6,245 91 | Red River..... | Includes work at Cairo, Hurricane Bluff, Bayou Pierre, Levy, Tones Bayou. The U. S. Gov. paid 5 cents additional on 43,916 cubic yards, for work on Tones Bayou dike. |
| 167,587 | 10.00 | 16,753 70 | Red River..... | Includes work at Eyric Point. |
| 170,909 | 10.45 | 17,859 99 | Red River..... | |
| 407.845 | ..... | $40,859 60 | | |
| 67,403 | ..... | 6,740 30 | | |
| 340,442 | ..... | $34,119 30 | | |
| ..... | ..... | ..... | ..... | Average price 10.02 cents per cubic yard |

## APPENDIX A. STATEMENT

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| | | | | | BOSSIER LEVEE | |
| 30 | Taylor | Bossier | Aug. 10, 1898 | Nov. 28, 1898 | 1,867 | |
| 31 | Cash Point | Bossier | Sep. 21, 1897 | May 28, 1898 | 15,303 | 4,724 |
| 32 | Shady Grove | Bossier | Nov 22, 1898 | May 8, 1899 | 5,276 | |
| 33 | Dillards | Bossier | Dec. 15, 1899 | | 6,517 | |
| 34 | Fullilove | Bossier | Mar. 19, 1898 | May 28, 1898 | 5,993 | |
| 35 | Buckhorn | Bossier | Jan. 19, 1900 | Apr. 18, 1900 | 9,065 | |
| 36 | Bear Point | Bossier | Feb. 28, 1900 | | 6,200 | |
| | Totals | | | | 50,221 | 4,724 |
| | Less amount done previous to April 20, 1898, and not completed April 20, 1900 | | | | 21,631 | 770 |
| | Work done from April 20, 1898, to April 20 1900 | | | | 28,590 or 5.41 mls | 3,954 or 0.75 mls |
| | | | | | RED RIVER, ATCHAFALAYA AND BAYOU BŒUF | |
| 37 | Bayou Rapides | Rapides | Sep. 28, 1899 | Dec. 21, 1899 | | 7,420 |
| 38 | Williams | Rapides | Nov. 15, 1898 | Apr. 14, 1899 | 6,600 | |
| 39 | Choctaw Bayou | Avoyelles | Aug. 22, 1898 | Jan. 7, 1899 | 15,470 | |
| 40 | Howard | Avoyelles | Sep. 13, 1899 | Mar 28, 1900 | 274 | 6,060 |
| 41 | Wayside | Avoyelles | Sep. 13, 1899 | Jan. 27, 1900 | | 3,420 |
| 42 | DeLee Enlargement | Avoyelles | Nov. 10, 1898 | Mar. 28, 1899 | | 9,530 |
| 43 | Green Store | St. Landry | Sep. 16, 1899 | Dec. 22, 1899 | | 4,453 |
| 44 | Elba | St. Landry | Sep. 16, 1899 | Feb. 19, 1900 | 200 | 4,619 |
| | Totals | | | | 22,544 or 4.27 mls | 35,502 or 6.72 mls |
| | The above is divided by streams as follows: | | | | | |
| | On Bayou Rapides | | | | | 1.40 mls |
| | On Red River | | | | 4.18 mls | |
| | On Bayou des Glaizes | | | | 0 05 mls | 1.80 mls |
| | On Atchafalaya River | | | | 0.04 mls | 3.52 mls |
| | Totals | | | | 4.27 mls | 6.72 mls |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| DISTRICT | | | | |
| 9,499 | 7.90 | $750 42 | Red River.. | |
| 156,911 | 12.99 | 20,382 71 | Red River | Includes work at Cash Point, Jeter, Colquitt Point, Gilmer Lane. |
| 57,562 | 9.00 | 5,180 58 | Red River | Includes work at Cash Point. |
| 51,728 | 9.75 | 5,043 48 | Red River | Completed, final certificate not issued. |
| 55,740 | 6.00 | 3,344 40 | Red River | Includes work at Nicholson. |
| 36,939 | 9.73 | 3,594 16 | Red River | |
| 71,023 | 11.20 | 7,954 57 | Red River | |
| 439,402 | ..... | $46,250 32 | | |
| 222,758 | ..... | 26,139 49 | | |
| 216,644 | ..... | $20,110 83 | | |
| .... | ..... | ..... | ..... | Average price 9 28 cents per cubic yard |
| LEVEE DISTRICT | | | | |
| 36,357 | 24.38 | $8,863 83 | Bayou Rapides | |
| 48,741 | 9.00 | 4,386 69 | Red River | |
| 79,304 | 9 1/3 | 7,401 70 | Red River | U. S. Gov. built 10,000 feet additional. |
| 14,676 | 11.74 | 1,722 95 | Bayou des Glaizes | Includes work at Callahan. |
| 8,201 | 16.45 | 1,890 06 | Bayou des Glaizes | |
| 33,049 | 11.24 | 3,714 70 | Atchafalaya River | |
| 19,211 | 14.75 | 2,833 62 | Atchafalaya River | |
| 18,678 | 14.00 | 2,614 92 | Atchafalaya River | Includes work at Morgan Ferry. |
| 258,217 | ..... | $32,928 47 | | |
| ..... | ..... | ..... | ..... | Average price 12.75 cents per cubic yard |
| 36,357 | ..... | $8,863 83 | | |
| 128,045 | ..... | 11,788 39 | | |
| 22,877 | ..... | 3,113 01 | | |
| 70,938 | ..... | 9,163 24 | | |
| 258,217 | ..... | $32,928 47 | | |

## APPENDIX A. STATEMENT

### RECAPITULATION.

| DISTRICT | MILES | |
|---|---|---|
| | New Levee | Enlargement |
| Fifth Louisiana Levee District | 2.75 | 1.70 |
| Atchafalaya Basin Levee District | 1.30 | 3.80 |
| Pontchartrain Levee District | 0.42 | 2.61 |
| Lafourche Basin Levee District | 2.11 | ..... |
| Lake Borgne Basin Levee District | 0.67 | 1.69 |
| Grand Prairie Levee District | 3.05 | 0.57 |
| Buras Levee District | 1.10 | 2.83 |
| Caddo Levee District | 4.50 | 3.39 |
| Bossier Levee District | 5.41 | 0.75 |
| Red River, Atchafalaya and Bayou Bœuf Levee District | 4.27 | 6.72 |
| Totals | 25.58 | 24.06 |

No. 1.—Continued. STATE CONTRACTS.

| Cubic Yards | Average Price—Cents | Cost | REMARKS |
|---|---|---|---|
| 581,754 | 15.24 | $88,653 70 | |
| 285,638 | 15.36 | 43,871 83 | |
| 160,980 | 19.78 | 31,846 42 | |
| 266,449 | 13.23 | 35,241 08 | |
| 65,273 | 14.21 | 9,270 87 | |
| 62,829 | 12.29 | 7,715 24 | |
| 63,696 | 13.06 | 8,322 09 | |
| 340,442 | 10.02 | 34,119 30 | |
| 216,644 | 9.28 | 20,110 83 | |
| 258,217 | 12.75 | 32,928 47 | |
| 2,301,967 | 13.56 | $312,079 28 | |

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Tensas
1898, to April 20, 1900, with

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Oppossum Fork South.... | Desha Co., Ark. | Aug.23,1898 | Oct. 10,1899 | ..... | 7,530 |
| 2 | Banquette St'n 785 to 798. | Desha Co., Ark. | Feb. 6, 1899 | Apr 3, 1899 | ..... | 1,300 |
| 3 | Chicot Front..... ... | Desha Co., Ark. | Aug.25,1899 | Feb. 7, 1900 | 1,242 | 2,500 |
| 4 | Two Mile Loop..... | Desha Co., Ark. | ..... | Nov. 8, 1899 | ..... | 1,300 |
| 5 | Arkansas City Loop..... | Desha Co., Ark. | Aug.13,1898 | Aug. 4, 1899 | ..... | 9,900 |
| 6 | Fulton Lake No. 2.... ... | Desha Co., Ark. | ..... | Jan. 3, 1898 | ..... | ..... |
| 7 | Fulton Lake Extension No. 2 ..... | Desha Co., Ark. | Aug. 3, 1898 | Aug. 8, 1899 | ..... | 4,070 |
| | Totals..... | ..... | ..... | ..... | 1,242 | 26,600 |
| Less work done previous to April 20, 1898. ..... | | | | ..... | ..... | 1,070 |
| Work done from April 20, 1898, to April 20, 1900..... | | | | ..... | 1,242 or0.24mls | 25,530 or4.83mls |
| | Weed cutting ..... ..... ..... | | | Aug.22,1899 | ..... ... | ..... |
| | Weed cutting ..... ..... ..... | | | Aug 28,1899 | ..... | ..... |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named. and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 4. ATCHAFALAYA BASIN LEVEE DISTRICT.

falaya Basin Levee District, under fourteen contracts, entered into from of earlier date, not completed April 20, 1898.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 7,519 | 15 ¾ | $1,184 24 | Mississippi River. | |
| 139,607 | 21 ½ | 30,015 50 | Mississippi River. | |
| 38,524 | 16.95 | 6,529 82 | Mississippi River. | |
| 66 895 | 13.95 | 9,331 86 | Mississippi River. | |
| 129,800 | 14.70 | 19,080 60 | Mississippi River. | |
| 104,895 | 13.00 | 13,636 35 | Mississippi River. | |
| 15,829 | 30.00 | 4,748 70 | Mississippi River. | |
| 16,050 | 16 ⅛ | 2,648 25 | Mississippi River. | |
| 820,756 | Scale | 142,292 28 | Mississippi River. | |
| 47,900 | Scale | 11,975 00 | AtchafalayaRiver | |
| 88,289 | ..... | 13,447 29 | Mississippi River. | |
| 109,582 | ..... | 18,131 95 | Mississippi River. | |
| 52,857 | Scale | 8,162 37 | AtchafalayaRiver | |
| 167,356 | .... ... | 25,794 87 | Bayou Lafourche. | |
| 300,000 | 15 ¼ | 45,750 00 | Bayou Lafourche. | |
| 1,152,200 | 16.00 | 184,352 00 | Bayou Lafourche. | |
| 113,216 | 13.00 | 14,718 80 | Bayou Lafourche. | |
| 80,254 | 16.45 | 13,201 78 | Bayou Lafourche. | |
| 29,465 | 14.00 | 4,125 10 | Bayou Lafourche. | |
| 1,921 | 12.00 | 230 52 | Bayou Lafourche. | |
| 21,617 | 14.00 | 2,628 40 | Bayou Lafourche. | |
| 6,498 | 14.00 | 909 72 | Bayou Lafourche. | |
| 9,800 | 11 ½ | 1,127 00 | Bayou Lafourche. | |
| 109,348 | 12 ½ | 13,805 18 | AtchafalayaRiver | |
| 63,287 | 16 ¼ | 10,442 35 | AtchafalayaRiver | |
| 36,770 | 23.40 | 8,604 18 | AtchafalayaRiver | |
| 3,730,235 | ..... | $606,874 11 | | |
| 492,040 | ..... | 74,646 89 | | |
| 3,238,195 | ..... | $532,227 22 | | |
| ..... | ..... | ..... | ..... ..... | Average price 16.43 cents per cubic yard |
| 9,918 | ..... | $446 31 | ..... | 4½ cents additional payment on State contract. |
| 1,375,108 | ..... | $238,495 82 | | |
| 1,579,327 | ..... | 244,404 69 | | |
| 283,762 | ..... | 49,326 71 | | |
| 3,238,195 | ..... | $532,227 22 | | |

list of dimensions furnished, and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Pont-
20, 1898, to April 20, 1900, with six contracts of

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Upper District Protection | E. Baton Rouge | Apr. 5.1898 | May 28,1898 | 1,526 | ..... |
| 2 | St. Gabriel Lane | Iberville | Feb. 7,1899 | Mar.28,1899 | .. ..... | 1,745 |
| 3 | Bagatelle, | Iberville | Dec. 30.1897 | Sep. 1,1898 | ..... | 2,242 |
| 4 | Nita | St. James | Dec. 30,1897 | Nov.22,1898 | ..... | 5,120 |
| 5 | Belmont | St. James | Dec. 30,1897 | Nov.22,1898 | ..... | 1,418 |
| 6 | St. Elmo | St. James | Feb. 5,1898 | Aug.12,1898 | ..... | 3,800 |
| 7 | Hermitage, Good Hope and Sarpy | St. Charles | Dec. 30,1897 | Oct 21,1899 | ..... | 8,245 |
| | Totals | .... | ..... | ..... | 1,526 | 22,570 |
| | Less amount done previous to April 20. | | 1898..... | ..... | 1,305 | 15,384 |
| | Work done from April 20, 1898 to April 20, | | 1900..... | ..... | 221 or0.04mls | 7,186 or1 36mls |
| | In addition to the above, certificateswere issued for the fol owing work not payable by the cubic yard : | | | | | |
| | Cutting weeds | St. James, St. John, St. Charles and Jefferson. | Aug 10,1899 | Oct. 6,1899 | ..... | ..... |
| | Chenet | St John ... .... | July 31,1899 | Nov. 6,1899 | ..... | ..... |
| | Good Hope | St. Charles ..... | July 31,1899 | Nov.11,1899 | ..... | ..... |

NOTE.—The number of cubic yards given in the foregoing statement is based upon levees named, and the cost is obtained by applying the price per cubic yard bid for the by the Levee Commissioners.

No. 5. PONTCHARTRAIN LEVEE DISTRICT.

chartrain Levee District, under one contract entered into from April earlier date, not completed April 20, 1900.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 52,827 | 17 00 | $8,980 59 | Mississippi Riv. | |
| 5,955 | 19 00 | 1,131 45 | Mississippi Riv. | |
| 7,912 | 18 ¾ | 1,483 50 | Mississippi Riv | |
| 20,584 | 18 ¾ | 3,859 50 | Mississippi Riv. | |
| 4,834 | 18 ¾ | 906 38 | Mississippi Riv. | |
| 10,391 | 18 ¾ | 1,948 31 | Mississippi Riv. | |
| 30,925 | 18 ¾ | 5,798 43 | Mississippi Riv. | |
| 133,428 | ..... | $24,108 16 | | |
| 104,269 | ..... | 18,587 90 | | |
| 29,159 | ..... | $5,520 26 | | |
| ..... .. | ..... | ..... | ..... | Average price 18 91 cents per cubic yard. |
| ..... .... | ..... | $1,200 50 | | |
| ..... | ..... | 512 40 | | |
| ..... | ..... | 1,080 00 | | |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest or other incidental expences incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Lafour-
20, 1898, to April 20, 1900, with one contract of

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Lorio | St. Charles | | Mar.14,1899 | | 1,200 |
| 2 | Morgan's Wharf to Harvey's Canal | Jefferson | July 14,1898 | Jan. 23,1899 | 1,827 | |
| 3 | Gouldsboro | Jefferson | Oct. 5, 1898 | Jan. 11,1899 | 800 | |
| 4 | St. Rosalie | Plaquemines | | Nov.27,1899 | 185 | |
| 5 | Myrtle Grove | Plaquemines | | Jan. 17,1900 | 1,150 | 1,800 |
| 6 | West Pointe-a-la-Hache | Plaquemines | | Dec. 30,1898 | 2,460 | |
| 7 | Lockport to Lagarde | Lafourche | | Feb. 7, 1900 | | 800 |
| 8 | Mississippi River and Bayou Lafourche No. 2. | | Jan. 11,1898 | Jan. 20,1899 | | |
| | Section No. 10 | | | | 3,137 | 10,690 |
| | Section No. 3 | | | | 3,600 | 4,030 |
| | Section No. 4 | | | | 12,224 | |
| | Section No. 9 | | | | 13,907 | 490 |
| | Section No. 10 | | | | 1,405 | 150 |
| 9 | Mississippi River and Bayou Lafourche | | Dec. 26,1898 | Mar. 5, 1900 | | |
| | Section No. 4 | | | | 9,027 | |
| | Section No. 6 | | | | 3,240 | |
| | Section No. 8 | | | | 6,260 | 4,737 |
| | Section No. 9 | | | | 1,405 | 16,875 |
| | Section No. 10 | | | | 6,710 | |
| 10 | Mississippi River and Bayou Lafourche Ext'n | | Jan. 2, 1900 | | | |
| | Section No. 4 | | | | | 774 |
| | Section No. 8 | | | | 1,598 | 5,400 |
| | Section No. 9 | | | | 1,864 | |
| | Totals | | | | 70,799 | 46,946 |
| Less amount done previous to April 20, 1898 | | | | | 2,067 | 4,032 |
| Work done from April 20, 1898, to April 20, 1900 | | | | | 68,732 or13.02mls | 42,914 or8.12mls |
| The above is divided by streams as follows: | | | | | | |
| On the Mississippi River | | | | | 1.81mls | 2.59mls |
| On Bayou Lafourche | | | | | 11 21mls | 5.53mls |
| Totals | | | | | 13.02mls | 8.12mls |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 2. TENSAS BASIN LEVEE DISTRICT.

Basin Levee District, under six contracts entered into from April 20, one contract of earlier date.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 74,831 | 19.95 | $14,928 78 | Mississippi Riv. | |
| 5,511 | 14.25 | 785 31 | Mississippi Riv. | |
| 61,555 | 13.99 | 8,611 54 | Mississippi Riv. | |
| 11,080 | 23.00 | 2,536 90 | Mississippi Riv. | |
| 48,892 | 14 ¾ | 7,272 68 | Mississippi Riv. | |
| 11,000 | 22.00 | 2,420 00 | Mississippi Riv. | |
| 33,295 | 22.00 | 7,324 90 | Mississippi Riv. | |
| 246,114 | ..... | $43,880 11 | | |
| 11,780 | ..... | 2,591 60 | | |
| 234,334 | ..... | $41,288.51 | | |
| ..... | ..... | ..... | ..... | Average price 17.64 cents per cubic yard |
| ..... | ..... | $210 00 | Amos Bayou.... | |
| ..... | ..... | 114 80 | Mississippi Riv. | |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

## APPENDIX A. STATEMENT

**Levee work undertaken by the Board of Commissioners of the Fifth April 20, 1898, to April 20, 1900, with four contracts**

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Ashton | East Carroll | | June15,1899 | | 6,000 |
| 2 | Cottonwood | East Carroll | Nov.27,1899 | Apr. 3, 1900 | 2,560 | |
| 3 | Cottonwood | East Carroll | Aug.15,1898 | Aug. 5, 1899 | | 14,964 |
| 4 | Longwood | East Carroll | Aug.15,1898 | Aug. 5, 1899 | | 11,000 |
| 5 | Elton | East Carroll | Aug.15,1898 | | | 15,859 |
| 6 | Blue Ridge | East Carroll | Aug.15,1898 | Feb. 2. 1900 | | 11,450 |
| 7 | Desona to Wyly | East Carroll | Aug.15,1898 | Jan. 20,1900 | | 4,310 |
| 8 | Otter Bayou to Point Lookout | East Carroll | Oct. 5, 1897 | Oct. 22,1898 | | 14,576 |
| 9 | Cabin Teele | Madison | Aug.15,1898 | Feb.20,1899 | | 8,000 |
| 10 | Sparta | Madison | Aug.16,1898 | Apr. 19,1899 | 3,865 | |
| 11 | Delta to O'Brien | Madison | Aug.15,1898 | Oct. 18,1899 | | 9,957 |
| 12 | Martin Loop Section of Diamond Island | Madison | Aug 11,1896 | June21,1898 | 2,160 | |
| 13 | Perkins' Extension | Tensas | | June22,1899 | | 3,000 |
| 14 | Bland Extension | Tensas | | May 31,1899 | | 1,100 |
| 15 | Hardscrabble | Tensas | | Feb.24,1899 | | 8,240 |
| 16 | Claggett | Tensas | Dec.13,1899 | Feb. 2, 1900 | 1,044 | |
| 17 | Claggett | Tensas | Feb.28,1898 | July 12,1898 | 1,213 | |
| 18 | Panola (U. S. Sec. 4) | Tensas | | | | 300 |
| | | | | | | 1,160 |
| 19 | Panola (U. S. Sec. 7) | Tensas | Jan. 27,1900 | Mar.28,1900 | | 2,346 |
| 20 | Cottage Home | Tensas | July 31,1899 | Feb.21,1900 | 10,810 | |
| 21 | Kempe | Tensas | | Feb. 9, 1899 | | 716 |
| 22 | Goldman | Tensas | Aug.29,1898 | June30,1899 | | 3,200 |
| | Totals | | | | 21,652 | 116,178 |
| | Less amount done previous to April 20, 1898 | | | | 254 | 11,500 |
| | Work done from April 20, 1898, to April 20, 1900 | | | | 21,398 or4.05mls | 104,678 or 19.82 mls |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

**Louisiana Levee District, under sixteen contracts, entered into from of earlier date, not completed April 20, 1898.**

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 12,650 | 14.00 | $1,771 00 | Mississippi Riv. | |
| 86,892 | 14.97 | 13,007 73 | Mississippi Riv. | |
| 61,689 | 15.18 | 9,364 39 | Mississippi Riv. | |
| 42,332 | 14.52 | 6,146 60 | Mississippi Riv. | |
| 133 782 | 15.94 | 21,316 83 | Mississippi Riv. | Completed. final certificate not issued. |
| 121,780 | 13.60 | 16,562 08 | Mississippi Riv. | |
| 26,939 | 17.44 | 4,698 16 | Mississippi Riv. | |
| 106,850 | 15.00 | 16,027 50 | Mississippi Riv. | |
| 8,882 | 13.00 | 1,154 66 | Mississippi Riv. | |
| 68,592 | 10.15 | 6,962 08 | Mississippi Riv. | |
| 68,829 | 14.90 | 10,255 52 | Mississippi Riv. | |
| 63,325 | 24.00 | 15,198 00 | Mississippi Riv. | |
| 8,560 | 16.00 | 1,369 60 | Mississippi Riv. | |
| 4,000 | 12.00 | 480 00 | Mississippi Riv. | |
| 8,216 | 30.00 | 2,464 80 | Mississippi Riv. | |
| 15,124 | 12.97 | 1,961 50 | Mississippi Riv. | |
| 30,705 | 13.00 | 3,991 65 | Mississippi Riv. | |
| 2,144 | 18.00 | 385 92 | Mississippi Riv. | Completed, final certificate not issued. |
| 7,048 | 13.00 | 916 04 | Mississippi Riv. | Completed, final certificate not issued. |
| 11,746 | 12 ½ | 1,468 25 | Mississippi Riv. | |
| 322,845 | 18.00 | 58,119 30 | Mississippi Riv. | |
| 2,069 | 30.00 | 620 70 | Mississippi Riv. | |
| 14,328 | 18.00 | 2,579 04 | Mississippi Riv. | |
| 1,229,317 | ..... | $196,821 49 | | |
| 95,979 | ..... | 14,829 27 | | |
| 1,133,338 | ..... | $181,992 22 | ..... | Average price 16.06 cents per cubic yard. |
| ..... | ... .. | ..... | | |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest or other incidental expenses incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Atcha-
April 20, 1898, to April 20, 1900, with nine contracts

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| 1 | Smithland | Pointe Coupee | Feb.18,1898 | May 3, 1898 | ..... | 1,390 |
| 2 | Allendale | W. Baton Rouge | Oct. 10,1898 | May 30,1899 | 2,950 | ..... |
| 3 | Plaquemine | Iberville | Sep. 1, 1897 | Mar.29,1899 | ..... | 4,066 |
| 4 | Fortville and St. Louis | Iberville | July 21,1897 | Sep. 17,1898 | ..... | 7,366 |
| 5 | Evergreen | Iberville | Apr. 26,1899 | ..... | 3,000 | ..... |
| 6 | McManor to Smoke Bend | Ascension | Mar.21,1898 | Mar.16,1899 | 250 | 10,632 |
| 7 | New Hope | Ascension | Apr. 19,1898 | Nov.12,1898 | ..... | 2,333 |
| 8 | Donaldsonville Bridge | Ascension | Nov.21,1898 | Jan. 19,1899 | 735 | 135 |
| 9 | Dameron and White | ..... | Sep. 5, 1898 | Feb. 3, 1900 | 3,241 | 72,354 |
| 10 | Dameron and White Dis't | ..... | Jan. 8, 1900 | ..... | 300 | ..... |
| | | | | | 1,572 | 7,611 |
| | | | | | ..... | 19,839 |
| 11 | Hart and White | ..... | Dec. 1, 1898 | Feb. 5, 1900 | 1,115 | ..... |
| | | | | | 6,164 | 3,740 |
| 12 | Klotzville to Napoleonville | Assumption | Jan. 10,1898 | Jan. 5, 1900 | 9,048 | 20,570 |
| 13 | Lafourche Enlargement | ..... | Apr. 22,1896 | ..... | 7,273 | 141,927 |
| 14 | St. Rose | Lafourche | Jan. 8, 1900 | ..... | 5,914 | ..... |
| 15 | Babin | Lafourche | Sep. 1, 1897 | Jan. 4, 1899 | 3,676 | ..... |
| 16 | Lafourche Repair | Lafourche | Jan. 9, 1899 | Oct. 3, 1899 | ..... | 8,473 |
| 17 | Bourgeois Front | Lafourche | ..... | Feb.19,1900 | ..... | 430 |
| 18 | Repair Work | Lafourche | ..... | Sep. 22,1899 | ..... | ..... |
| 19 | Lockport Town Front | Lafourche | July 10,1899 | Dec.19,1899 | ..... | 3,135 |
| 20 | Foret | Lafourche | Aug. 7, 1899 | ..... | ..... | 2,100 |
| 21 | Lucky Hit No. 2 | Pointe Coupee | Dec.20,1897 | Oct. 17,1898 | 3,675 | 12,554 |
| 22 | Morris Bayou | Pointe Coupee | Feb.10,1898 | Feb.16,1899 | 2,056 | 49,311 |
| 23 | Bayou Latanache | Pointe Coupee | July 31,1899 | Dec. 4, 1899 | 2,200 | ..... |
| | Totals | ..... | ..... | ..... | 53,169 | 367,986 |
| | Less work not completed | April 20, 1898 | ..... | ..... | 6,112 | 50,029 |
| | Work done from April 20, | 1898, to April 20, | 1900 | ..... | 47,057 or8.91mls | 317,957 or60.22mls |
| | Belair to Homestead | W. Baton Rouge | ..... | ..... | ..... | ..... |

The above is divided by streams as follows:

| | | |
|---|---|---|
| On the Mississippi River | 2.22mls | 22.18mls |
| On Bayou Lafourche | 5.53mls | 27.84mls |
| On the Atchafalaya River | 1.16mls | 10.20mls |
| Totals | 8.91mls | 60.22mls |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 6. LAFOURCHE BASIN LEVEE DISTRICT.

che Basin Levee District, under ten contracts, entered into from April earlier date not completed April 20, 1898.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 5,222 | ..... | $784 60 | Mississippi River. | |
| 35,720 | 18.00 | 6,429 60 | Mississippi River. | |
| 18,554 | 30.00 | 5,660 20 | Mississippi River. | |
| 1,007 | ..... | 161 12 | Mississippi River. | |
| 15,257 | ..... | 2,682 72 | Mississippi River. | |
| 13,439 | 18.00 | 2,419 02 | Mississippi River. | |
| 5,161 | Scale | 746 73 | Bayou Lafourche. | |
| ..... | Scale | ..... | | |
| 152,545 | ..... | 24,551 01 | Mississippi River. | |
| 95,400 | ..... | 13,474 00 | Bayou Lafourche. | |
| 258,175 | ..... | 38,085 62 | Bayou Lafourche. | |
| 245,549 | ..... | 33,865 50 | Bayou Lafourche. | |
| 16,508 | ..... | 1,781 56 | Bayou Lafourche. | |
| ..... | Scale | ..... | | |
| 186,716 | ..... | 32,758 34 | Bayou Lafourche. | |
| 69,802 | ..... | 12,320 95 | Bayou Lafourche. | |
| 98,931 | ..... | 16,770 04 | Bayou Lafourche. | |
| 86,495 | ..... | 11,352 32 | Bayou Lafourche. | |
| 96,085 | ..... | 13,763 57 | Bayou Lafourche. | |
| ..... | Scale | ..... | | |
| 20,955 | ..... | 2,512 55 | Bayou Lafourche. | |
| 55,686 | ..... | 9,283 72 | Bayou Lafourche. | |
| 43,350 | ..... | 7,781 26 | Bayou Lafourche. | |
| 1,520,557 | ..... | $237,079 43 | | |
| 61,999 | ..... | 8,540 14 | | |
| 1,458,558 | ..... | $228,539 29 | | |
| ..... | ..... | ..... | ..... ..... | Average price 15.66 cents per cubic yard |
| 241,744 | ..... | $42,638 27 | | |
| 1,216,814 | ..... | 185,901 02 | | |
| 1,458,558 | ..... | $228,539 29 | | |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners for the Grand

April 20, 1898

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Mrs. Cannon's to Winn Canal | Plaquemines | Aug. 11, 1899 | Jan. 13, 1900 | 2,645 | ..... |
| 2 | Burton to Edgecombe's. | Plaquemines | Aug. 11, 1899 | Jan. 29, 1900 | 11,065 | ..... |
| 3 | Jacomini to Quarantine Canal | Plaquemines | Aug. 10, 1899 | Dec. 15, 1899 | 7,584 | ..... |
| 4 | Angello to Polite's Canal | Plaquemines | Aug 10, 1899 | Jan. 18, 1900 | 1,950 | ..... |
| 5 | Barrelli to Beck | Plaquemines | Aug 10, 1899 | Jan. 18, 1900 | 777 | ..... |
| 6 | Rivers to Butler's | Plaquemines | Aug. 10, 1899 | Jan. 18, 1900 | 1,293 | ..... |
| | Work done from April 20, | 1898, to April 20, | 1900 | ..... | 27,262 or 5.16 mls | ..... ..... |
| | Grand Prairie Repair | Plaquemines | ..... | Nov. 27, 1899 | ..... | 2,120 |

NOTE.—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 7. GRAND PRAIRIE LEVEE DISTRICT.

Prairie Levee District, under six contracts entered into from to April 20, 1900.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 8,488 | 12 ½ | $1,075 84 | Mississippi Riv. | |
| 28 804 | 14.00 | 4,032 56 | Mississippi Riv. | |
| 14 298 | 12 ½ | 1,787 25 | Mississippi Riv | |
| 3,837 | 13.00 | 498 81 | Mississippi Riv. | |
| 1 208 | 12.94 | 156 31 | Mississippi Riv. | |
| 3,281 | 12.94 | 424 56 | Mississippi Riv. | |
| 64,721 | ..... | $8,603 56 | | |
| ..... | ..... | ..... | ..... | Average price 13.29 cents per cubic yard |
| 4,038 | ..... | ..... | Mississippi Riv. | Work done by local inspector. |

list of dimensions furnished, and estimates made by the Board of State Engineers for the work, without regard to discount, interest or other incidental expenses incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners for the

April 20, 1898,

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Pignola to Zibilich..... | Plaquemines... | Oct. 2, 1899 | Dec. 5, 1899 | ..... | 530 |
| 2 | Pignola..... ..... | Plaquemines... | Oct. 2, 1899 | Dec. 23, 1899 | 400 | ..... |
| | Totals..... | ..... .... | ..... | ... ..... | 400 or 0.08 mls | 530 or 0.10 mls |

NOTE.—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## No. 8. BURAS LEVEE DISTRICT.

Buras Levee District, under two contracts entered into from to April 20, 1900.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 1,087 | 13.85 | $150 55 | Mississippi Riv. | |
| 1,660 | 16.00 | 265 60 | Mississippi Riv. | |
| 3,747 | ..... | $416 15 | | |
| ..... | ..... | ..... | ..... | Average price 15.15 cents per cubic yard. |

list of dimensions furnished, and estimates made by the Board of State Engineers for the work, without regard to discount, interest or other incidental expenses incurred

## APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of into from April 29,

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| 1 | Riverside | Bossier | Feb. 15, 1899 | July 6, 1899 | 8,340 or 1.58 mls | ..... .... ..... |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

No. 9. BOSSIER LEVEE DISTRICT.

the Bossier Levee District, under one contract entered 1898, to April 20, 1900.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 119,140 | 13.20 | $15,720 48 | Red River..... | |
| ..... | ..... | ..... .... | ..... ..... | Average price 13.20 cents per cubic yard. |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

## APPENDIX A. STATEMENT No. 10. RED RIVER,

**Levee work undertaken by the Board of Commissioners of the Red entered into from April 20, 1898, to April 20, 1900, with**

| Number | NAME OF CONTRACT | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|
| 1 | Upper Bayou des Glaizes | Avoyelles..... | Aug. 3, 1899 | ..... | 23,700 | ..... |
| 2 | Ten Mile Stretch..... | Avoyelles. ..... | Jan. 19,1898 | July 5, 1898 | 55,720 | ..... |
| 3 | Mill Bayou Dike..... | Avoyelles..... | Nov.28,1899 | Apr. 9, 1900 | ..... | 483 |
| | Totals..... | ..... | ..... | ..... | 79,420 | 483 |
| | Less amount done previ | ous to April 20, | 1898..... | ..... | 28,820 | ..... |
| | Work done from April 20, | 1898, to April 20, | 1900 ..... | ..... ... | 50,600 or5.46mls | 483 or0.09mls |
| | In addition to the above issued for the following able by the cubic yard: | certificate was work not pay- | | | | |
| | Bayou du Lac improving drainage..... | Avoyelles..... | July 6, 1899 | Jan. 9, 1900 | ..... ... | ..... |

NOTE—The number of cubic yards given in the foregoing statement is based upon the levees named, and the cost is obtained by applying the price per cubic yard bid for by the Levee Commissioners.

## ATCHAFALAYA AND BAYOU BŒUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Bœuf Levee District, under two contracts one contract of earlier date, not completed April 20, 1898.

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 92,128 | 9.24 | $8,612 62 | Bayou des Glaizes.... | Completed, final certificate not issued. |
| 234,327 | 8 ¼ | 19,331 97 | Bayou des Glaizes.... | |
| 4,179 | 19.95 | 833 71 | Bayou des Glazes.... | |
| 330,634 | ..... | $28,778 30 | | |
| 121,327 | ..... | 10,009 47 | | |
| 209,307 | ..... | $18,768 83 | | |
| ..... | ..... | ..... | ..... ..... | Average price 8.96 cents per cubic yard. |
| ..... | ..... | $13,243 00 | | |

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

## APPENDIX A. STATEMENT

The Board of State Engineers is indebted to Mr. Gervais Lombard, work undertaken by the Orleans Levee Board under nine

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement | Revetment | Pile Bank Protection |
| 1 | Egania Street to Upper Line of Ursulines Convent | Orleans | Sep. 19,1898 | Mar. 29,1899 | ..... | ..... | ..... | 3,130 |
| 2 | N. O. & N. E. to Alvar street and Lesseps street to below Jackson Saw Mill | | Sep. 19,1898 | Mar. 29,1899 | ..... | ..... | ..... | 3,860 |
| 3 | Alvar to Lesseps Street | | Sep. 20,1898 | Feb. 16,1899 | ..... | ..... | ..... | 1,200 |
| 4 | La. avenue to Toledano street | | Oct. 5, 1898 | Dec. 1, 1898 | ..... | ..... | 380 | ..... |
| 5 | Above Hotard's Saw Mill, 5th District | | Oct. 5, 1898 | Dec. 16, 1898 | ..... | 627 | 627 | ..... |
| 6 | Beka Plantation | | Oct. 5, 1898 | Nov. 14, 1898 | ..... | 664 | 664 | ..... |
| 7 | McLellanville and Cassillard | | Sep. 18, 1899 | Dec. 6, 1899 | ..... | 4,409 | 3,547 | ..... |
| 8 | Joseph street to Upper Line of Audubon Park | | Sep. 28, 1899 | Feb. 17, 1900 | 6,525 | ..... | 7,942 | ..... |
| 9 | France to Kentucky street | | Sep. 20, 1899 | Dec. 29, 1899 | ..... | ..... | ..... | 1,130 |
| | | | | | 6 525 | 5,700 | 13,160 | 9,320 |

Average price of earth work per cubic yard ..... 15.43 cents

Average price of wood work per 1000 feet B. M., including piling, which was bid for per linear feet ..... $16 86

## No. 11. ORLEANS LEVEE DISTRICT.

**Engineer of the Orleans Levee District, for the following statement of contracts entered into from April 20, 1898 to April 20, 1900.**

| Price per Cubic Yards of Earth | Price per 1000 Feet—B. M. | Price per Linear Feet of Piles | Number of Cubic Yards | Number of Feet B. M. | Number of Linear Feet of Piles | Total Cost | REMARKS |
|---|---|---|---|---|---|---|---|
| ..... | $21 70 | $ .14 7/10 | ..... | 1,025,450 | 191,949 | $50,468 77 | |
| ..... | 25 00 | .13 7/10 | ..... | 353,500 | 131 887 | 26,906 02 | |
| ..... | new, 23 65<br>old, 13 00 | .17<br>.15 | ..... | 476,298 | 150 465 | 37,108 91 | |
| ..... | 18 75 | ..... | ..... | 41,660 | ..... | 806 37 | Pile Bulkhead. |
| $.13½ | 20 00 | ..... | 8,652.2 | 37,658 | ..... | 1,255 33 | |
| .14½ | 23 00 | ..... | 786.4 | 29.514 | ..... | 794 81 | |
| .20½ | 23 40 | ..... | 16,207.7 | 213 000 | ..... | 8,306 78 | |
| .14⅞ | new, 29 95<br>old, 14 98 | ..... | 135,800.2 | 708,451 | ..... | 41,656 67 | This includes $1 276.05 for tile drainage. |
| ..... | new, 25 00<br>old, 13 00 | .16½ sq.<br>.14½ rnd | ..... | 442,132 | 72,078 | 21,784 67 | |
| ..... | ..... | ..... | ..... | 3,327,663 | 546,374 | $189,083 33 | |

## APPENDIX A. STATEMENT

**The Board of State Engineers is indebted to the courtesy of Captain Tollinger, United States Assistant Engineer, for the following States Government, in Upper Tensas District, in Arkansas,**

| Number | Station to Station. | | PARISH | DATE OF Contract | DATE OF Final Certificate | LINEAR FEET New Levee | LINEAR FEET Enlargement |
|---|---|---|---|---|---|---|---|
| | 0 to 655 | | Desha | July 18,1899 | Feb.28,1900 | | 65,500 |
| a | 655 to 680 | | Desha | Jan. 16,1899 | Nov. 6,1899 | 2,500 | |
| (b) | 680 to 707 | | Desha | Aug.18,1899 | Feb. 3, 1900 | 2,700 | |
| b | 707 to 734+30 | | Desha | Aug.18,1899 | Mar.15,1900 | 2,730 | |
| | 34 to 43 | | Desha | Aug.11,1898 | Sep.10,1898 | | 900 |
| | 150 to 214 | R 405 | Desha | Oct 15,1898 | Mar.22,1899 | | 6,400 |
| (d) | 180 to 230 | R 425 | Desha | Aug.11,1897 | June18,1898 | | 5,000 |
| | 420 to 484 | R 427 | Desha | Aug.31,1897 | July 31,1899 | | 6,400 |
| | 520 to 605 | R 429 | Desha | Aug 12,1898 | Nov.15,1899 | | 8,500 |
| | 605 to 630 | R 430 | Desha | Aug.12,1898 | Feb.15,1900 | | 2,500 |
| | 630 to 660 | R 430 | Desha | Aug.31,1897 | Oct. 1, 1899 | | 3,000 |
| | 680 to 710 | R 431 | Desha | Nov.11,1898 | Jan. 30,1899 | | 3,000 |
| | 710 to 750 | R 432 | Desha | Aug.12,1898 | Nov.19,1898 | | 4,000 |
| | 906 to 931 | R 438 | Desha | Nov. 9,1898 | Dec. 1,1899 | | 2,500 |
| (d) | 1080 to 1200 | R 441 | Desha | Nov. 7, 1896 | Nov.15,1900 | | 12,000 |
| | 1200 to 1240 | R 442 | Chicot | Aug.12,1898 | | | 4,000 |
| | 1240 to 1490 | R 444 | Chicot | Oct. 15,1898 | Mar.24,1899 | | 25,000 |
| | 1490 to 1510 | R 449 | Chicot | Aug.31,1897 | Jan. 22,1899 | | 2,000 |
| | 1730 to 1740 | R 451 | Chicot | Aug.12,1898 | Dec.16,1898 | | 1,000 |
| | 1740 to 1780 | R 452 | Chicot | Aug.31,1897 | Dec.17,1898 | | 4,000 |
| | 1780 to 1810+40 | R 466 | Chicot | July 6, 1898 | About Ap.10,1900 | | 3,040 |
| | 1810 to 1942 | R 466 | Chicot | Aug.11,1897 | Feb 13,1900 | | 13,200 |
| | 1826+35 to 1831+50 | R 466 | Chicot | Aug.27,1898 | Sep. 9,1898 | | 515 |
| | 1942 to 2047 | R 468 | Chicot | July 6, 1898 | Aug.11,1899 | | 10,500 |
| c | 2047 to 2147 | R 468 | Chicot | Oct. 16,1899 | Mar 31,1900 | | 10,000 |
| | 2562 to 2728 | R 488 | Chicot | July 18,1899 | Apr. 2,1900 | | 16,600 |
| | 2740 to 2850 | R 490 | Chicot | Aug.12,1898 | Jan. 31,1900 | | 11,000 |
| | 2850 to 3065 | R 494 | Chicot | Aug.12,1898 | Apr. 12,1899 | | 21,500 |
| | 2850 to 3065 | R 491 | Chicot | July 18,1899 | Mar.31,1900 | | 21,500 |
| | 3065 to 3100 | R 496 | Chicot | Aug.11,1897 | Oct. 12,1899 | | 3,500 |
| | 3100 to 3160 | R 496 | Chicot | Aug.11,1898 | Nov. 3,1899 | | 6,000 |
| | 3160 to 3185 | R 496 | Chicot | Aug.31,1897 | Mar.27,1899 | | 2,500 |
| | 3185 to 3400 | R 498 | Chicot | Aug.12,1898 | Mar.17,1899 | | 21,500 |
| | 3185 to 3400 | R 498 | Chicot | July 18,1899 | Mar. 1900 | | 21,500 |
| | 3400 to 3500 | R 505 | Chicot | July 6, 1898 | Aug.18,1899 | | 10,000 |
| | 3500 to 3600 | R 506 | Chicot | July 6, 1898 | About Ap.10,1900 | | 10,000 |
| | 3600 to 3700 | R 508 | Chicot | July 6, 1898 | Dec. 15,1899 | | 10,000 |
| | 3700 to 3760 | R 509 | Chicot | Aug.12,1898 | Dec.31,1898 | | 6,000 |

a Paid for by the Tensas, Chicot, Desha and Red Fork Levee Boards
b Paid for by the Tensas, Chicot, Desha and Red Fork Levee Boards and United States.

## No. 12. UNITED STATES LEVEES.

Chas. L. Potter, Corps of Engineers, U. S. A., through Mr. E. C. statement of "work done by and under the supervision of the United from April 20, 1898, to April 20, 1900."

| Cubic Yards | Price—Cents | Cost | STREAM | REMARKS |
|---|---|---|---|---|
| 92,046 | 21.00 | $19,329 66 | Arkansas River. | Topping. |
| 80,731 | 14 ½ | 11,706 00 | Arkansas River. | New Levee. |
| 109,051 | 20.36 | 22,202 78 | Arkansas River. | New Levee. |
| 71,336 | 13.00 | 9,273 68 | Arkansas River | New Levee. |
| 4,944 | 14.5 | 716 88 | Mississippi Riv. | |
| 3,203 | 27.00 | 864 81 | Mississippi Riv. | Topping. |
| 20,734 | 13 00 | 2,695 42 | Mississippi Riv. | Banquette. |
| 53,424 | 13 ½ | 7,213 24 | Mississippi Riv. | |
| 64,817 | 17.93 | 11,621 69 | Mississippi Riv | Topping. |
| 1,883 | 21.00 | 395 43 | Mississippi Riv. | Topping. |
| 43,177 | 12 00 | 5,181 24 | Mississippi Riv. | Enlargement and Banquette. |
| 9,646 | 11.49 | 1,108 33 | Mississippi Riv. | Banq ette. |
| 18,992 | 8.99 | 1,707 38 | Mississippi Riv. | |
| 18,541 | 21.99 | 4,077 16 | Mississippi Riv. | $2,484 96 paid by United States.<br>1,592 20 paid by Desha Levee Board.<br>$4,077 16 |
| 106,712 in place | 13.99 | 14,929 01 | Mississippi Riv | |
| 8,984 | 17.9 | ..... | Mississippi Riv | Suspended. |
| 20,181 | 20.00 | 4,036 20 | Mississippi Riv. | Topping. |
| 14,998 | 14 ⅜ | 2,155 96 | Mississippi Riv. | |
| 5,724 | 17.49 | 1,001 13 | Mississippi Riv. | |
| 58,105 | 15.9 | 9,238 70 | Mississippi Riv. | |
| 20,300 | 11.99 | 2,433 97 | Mississippi Riv. | |
| 155,905 | 16.00 | 24,944 80 | Mississippi Riv. | |
| 3,019 | 16.00 | 483 04 | Mississippi Riv. | Banquette. |
| 83,603 | 14.95 | 12,498 65 | Mississippi Riv. | |
| 19,797 | 24 ⅝ | 4,875 01 | Mississippi Riv | Topping (lee board). |
| 16,431 | 24 ¼ | 4,025 60 | Mississippi Riv. | Topping, United States. |
| 72,839 | 12.98 | 9,454 50 | Mississippi Riv. | |
| 29,814 | 12.98 | 3,869 86 | Mississippi Riv. | Topping. |
| 137,491 | 13.74 | 18,891 26 | Mississippi Riv. | |
| 30,920 | 14.00 | 4,328 80 | Mississippi Riv. | |
| 51,123 | 11.00 | 5,623 53 | Mississippi Riv. | |
| 21,378 | 15.00 | 3,206 70 | Mississippi Riv. | |
| 21,029 | 24.94 | 5,244 63 | Mississippi Riv. | Topping. |
| 116,213 | 14.00 | 16,269 82 | Mississippi Riv. | |
| 71,823 | 13 ⅝ | 9,785 88 | Mississippi Riv. | |
| 98,000 | 15.00 | 14,700 00 | Mississippi Riv. | Approximated. |
| 92,191 | 15.00 | 13,828 65 | Mississippi Riv. | |
| 50,582 | 12 ½ | 6,322 75 | Mississippi Riv. | |

c Paid for by the Tensas and Chicot Levee Boards.
(d) Included in report April 20, 1898.

## APPENDIX A. STATEMENT

The Board of State Engineers is indebted to the courtesy of Captain Tollinger, United States Assistant Engineer, for the following States Government, in the Upper Tensas District in Louisiana,

| Number | NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|---|
| | | | Contract | Final Certificate | New Levee | Enlargement |
| Sta.. | 1303—1363 (a) R 540..... | East Carroll | July 31,1899 | Mar 3,1900 | 6,000 | ..... |
| Sta. | 1679—1725 R 545..... | East Carroll | July 18,1899 | Jan. 12,1900 | ..... | 4,600 |
| Sta. | 2368—2411 R 562..... | East Carroll | July 18,1899 | Dec 6,1899 | ..... | 4,300 |
| Sta. | 2411—2500 R 562..... | East Carroll | July 6,1898 | Sep 8,1899 | ..... | 8,900 |
| Sta. | 2500—2601 R 564..... | East Carroll | Aug. 12,1898 | Oct. 28,1899 | ..... | 10,100 |
| Sta.. | 2810—2931 R 574..... | East Carroll | July 6,1898 | Oct. 2,1899 | ..... | 12,100 |
| Sta.. | 2931—3031 R 576..... | Madison ... | July 6,1898 | Nov 29,1899 | ..... | 10,000 |
| Sta.. | 3031—3118 R 577 .... | Madison .... | Aug 12,1898 | July 14,1899 | ..... | 8,700 |
| Sta.. | 3118—3197 R 575..... | Madison .... | Aug 12,1898 | Dec. 4,1899 | ..... | 7,900 |
| Sta.. | 3197—3277 R 580 ..... | Madison .... | Aug. 12,1898 | Dec. 28,1899 | ..... | 8,000 |
| Sta.. | 3277-3310 R 579 .... | Madison .... | Aug. 12,1898 | Dec. 16,1898 | ..... | 3,300 |
| Sta.. | 3310—3328 R 582..... | Madison .... | Aug 12,1898 | July 19,1899 | ..... | 1,800 |
| Sta.. | 3328—3428 R 582..... | Madison .... | Aug. 11,1897 | Oct. 3,1899 | ..... | 10,000 |
| Sta. | 3428—3550 R 582 .... | Madison .... | Aug. 11,1897 | Dec 20,1898 | ..... | 12,200 |
| Sta.. | 3763—3840 R 591..... | Madison .... | July 18,1899 | Nov 15,1899 | ..... | 7,700 |
| Sta.. | 4409—4432 R 603 .. .. | Madison ... | Aug. 11,1897 | Nov 9,1898 | ..... | 2,300 |
| Sta.. | 4432—4452 R 603 ..... | Madison .... | Aug. 11,1897 | Completed Oct. 3,1898 | 2,000 | ..... |
| Sta.. | 4452—4472 R 603..... | Madison .... | Aug. 11,1897 | May 2,1899 | 2,000 | ..... |
| Sta... | 4472-4492 R 604..... | Madison .... | Aug. 11,1897 | May 2,1899 | 2,000 | ..... |
| Sta.. | 4492—4507 R 604 ..... | Madison .... | Aug. 11,1897 | Sep 24,1898 | 1,500 | ..... |
| Sta. | 4507—4540 R 604..... | Madison .... | Aug. 11,1897 | May 18,1899 | ..... | T 3,300 |
| Sta.. | 4507—4540 R 604..... | Madison .... | July 18,1899 | Apr. 6,1900 | ..... | 3,300 |
| Sta.. | 4540—4551 R 605..... | Madison .... | Aug. 11,1897 | June 23,1899 | 1,100 | ..... |
| Sta.. | 4551—4570 R 605 .... | Madison .... | Aug 11,1897 | Apr. 18,1899 | ..... | T 1,900 |
| Sta. | 4551—4570 R 605..... | Madison ... | July 18,1899 | Feb. 13,1900 | ..... | 1,900 |
| Sta.. | 4570—4619 R 605 ..... | Madison .... | July 18,1899 | ..... | ..... | 4,900 |

## No. 13. UNITED STATES LEVEES.

**Chas. L. Potter, Corps of Engineers, U. S. A., through Mr. E. C. statement of work done by and under the supervision of the United from April 20, 1898, to April 20, 1900.**

| THIRD DISTRICT | | | | |
|---|---|---|---|---|
| Cubic Yards | Cost | Price—Cents | STREAM | REMARKS |
| 185,040 | $25,443 00 | 13 ¾ | Mississippi Riv. | New Levee. |
| 37,846 | 6,055 36 | 16 00 | Mississippi Riv. | Enlargement. |
| 46,426 | 12,767 15 | 27.5 | Mississippi Riv. | Enlargement. |
| 100,649 | 15,842 15 | 15 74 | Mississippi Riv. | Enlargement. |
| 83,670 | 11,713 80 | 14 00 | Mississippi Riv. | Enlargement. |
| 98,529 | 9,843 05 | 9 99 | Mississippi Riv. | Enlargement. |
| 91,115 | 16,947 39 | 18 6 | Mississippi Riv. | Enlargement. |
| 66,851 | 5,976 48 | 8 94 | Mississippi Riv. | Enlargement. |
| 83,070 | 14,121 90 | 17 00 | Mississippi Riv | Enlargement. |
| 74,441 | 8,523 49 | 11.45 | Mississippi Riv. | Enlargement. |
| 10,879 | 919 28 | 8.45 | Mississippi Riv. | Enlargement. |
| 12,504 | 1,181 63 | 9.45 | Mississippi Riv. | Enlargement. |
| 121,128 | 15,141 00 | 12 5 | Mississippi Riv. | Enlargement. |
| 106,806 | 12,539 02 | 11.74 | Mississippi Riv. | Enlargement. |
| 50,174 | 6,492 52 | 12.94 | Mississippi Riv. | Enlargement. |
| 21,472 | 3,907 90 | 18.2 | Mississippi Riv. | Enlargement. |
| 105,680 | 29,062 00 | 27.5 | Mississippi Riv. | New Levee. |
| 129,381 | 35,579 77 | 27.5 | Mississippi Riv. | New Levee. |
| 115,563 | 31,779 82 | 27.5 | Mississippi Riv. | New Levee. |
| 87,425 | 24,041 88 | 27.5 | Mississippi Riv. | New Levee. |
| 750 | 225 00 | 30 00 | Mississippi Riv. | Topping. |
| 48,244 | 15,438 08 | 32.00 | Mississippi Riv. | Enlargement. |
| 90,612 | 33,299 91 | 36 75 | Mississippi Riv. | New Levee. |
| 3,978 | 1,193 40 | 30 00 | Mississippi Riv. | Topping. |
| 13,082 | 4,055 42 | 31.00 | Mississippi Riv. | Enlargement. |
| ..... | ..... | 30.5 | Mississippi Riv. | Enlargement, Incomplete. |

APPENDIX A. STATEMENT No. 14.

## UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Major George McC. Derby, Corps of Engineers, United States Army, for the following statement of levees built and enlarged by the United States, in the Fourth District, improving Mississippi River, from opposite Warrenton, Miss., to head of passes, from April 20, 1898, to Apri 20, 1900.

| NAME OF LEVEE | Miles below Cairo | Length of Line Completed | New or Enlargement | Date of Completion | Total Cubic Yards | Total Cost |
|---|---|---|---|---|---|---|
| **Lower Tensas District** | | | | | | |
| Palmyra Island | 622 R.. | 10,310 | Enlarg'nt.. | May 29,1899 | 22,423 67 | ..... |
| Evergreen-Bondurant— | | | | | | |
| Lot 1, Sections 1— 6.. | 640 R.. | 2,819 | New..... | Feb.22,1900 | 78,013.09 | ..... |
| Lot 2, Sections 7—12 . | 640 R.. | 2,400 | New..... | Mar 3,1900 | 67,015.15 | ..... |
| Lot 3, Sections 13—18 . | 640 R.. | 3,300 | New..... | Mar.19,1900 | 77,920.32 | ..... |
| Lot 4, Sections 19—24.. | 640 R. | 2,900 | New..... | Nov 23,1899 | 77,835.56 | ..... |
| Lot 5, Sections 25—30.. | 640 R.. | 2,900 | New..... | Nov.23,1899 | 81,720.18 | ..... |
| Lot 6, Sections 31—36. | 640 R.. | 2,100 | New..... | Nov.17,1899 | 69,666 19 | ..... |
| Lot 7, Sections 37—42 . | 640 R | 1,700 | New..... | Jan. 16,1900 | 73,184.89 | ..... |
| Lot 8, Sections 43—48 | 640 R.. | 2,300 | New..... | Jan. 16 1900 | 78,463.46 | ..... |
| Lot 9, Sections 49—54 . | 640 R . | 2,900 | New ..... | Jan. 22,1900 | 74,336.04 | ..... |
| Lot 10, Sections 55—60.. | 640 R.. | 4.500 | New..... | Nov 18,1899 | 71,168.21 | ..... |
| Lot 11, Sections 61—67.. | 640 R.. | 3,500 | New ..... | Nov.12,1899 | 64,675.34 | ..... |
| Lot 12, Sections 68—73.. | 640 R.. | 5,106 | New..... | Jan. 7 1900 | 92,338.63 | ..... |
| Catfish Bayou Dyke..... | 642 R.. | 200 | New..... | Oct 31,1899 | 14,825.32 | ..... |
| Panola— | | | | | | |
| Sections 1 — 2..... | 646 R.. | 5,429 | Enlarg'nt. | Oct. 29,1898 | 27,185.36 | ..... |
| Sections 5 — 6..... | 647 R.. | 3,400 | Enlarg'nt. | Dec.27,1898 | 28,128.00 | ..... |
| Duckpond— | | | | | | |
| Section 3 ..... | 650 R.. | 2,889 | Enlarg'nt. | Nov. 6,1898 | 19,455.77 | ..... |
| Section 4..... | 650 R . | 2,441 | Enlarg'nt. | Sep 8,1898 | 14,091.26 | ..... |
| Minnehaha ..... | 652 R.. | 2,482 | New..... | Feb.13,1900 | 52,258.94 | ..... |
| Kempe..... | 657 R.. | 2,321 | New..... | Mar.21,1899 | 99,155.99 | ..... |
| Kempe Extension..... | 657 R. | 2,274 | New..... | Built by U. S. | ... ..... | ..... |
| Stockridge— | | | | | | |
| Sections 1— 5..... | 659 R.. | 5,052 | Enlarg'nt | part completed. | 41,869.39 | ..... |
| Sections 6 — 9 ..... | 661 R.. | 4,909 | Enlarg'nt. | Mar.10,1899 | 41,388.57 | ..... |
| Waterproof— | | | | | | |
| Sections 1 — 4..... | 662 R.. | 8,000 | Enlarg'nt. | Mar.31,1899 | 72,796.24 | ..... |
| L'Argent— | | | | | | |
| Sections 1 — 24..... | 664 R.. | 8,314 | New..... | Nov.12 1898 | 373,220.24 | ..... |
| Aquasco. ..... | 679 R. | 5,527 | New..... | Jan. 22,1900 | 40,189.90 | ..... |
| Delhi— | | | | | | |
| Sections 4 — 15..... | 680 R.. | 8,876 | Enlarg'nt. | Aug. 2,1898 | 155,785.59 | ..... |
| Rifle Point— | | | | | | |
| Section 1 ..... | 689 R.. | 4,181 | Enlarg'nt. | Sep.24,1898 | 31,931.73 | ..... |
| Esperanza— | | | | | | |
| Sections 1 — 4..... | 711 R.. | 300 | Enlarg'nt. | part completed. | 5,498.59 | ..... |
| Sections 6 — 10..... | 715 R.. | 1,700 | Enlarg'nt. | Aug 31,1898 | 30,991.90 | ..... |
| Sections 13 — 15..... | 715 R.. | 2,200 | Enlarg'nt. | June20,1898 | 30,764.71 | ..... |
| Sections 16 — 19..... | 715 R.. | 2,600 | Enlarg'nt | Feb.23,1900 | 40,719.36 | ..... |
| Ashley— | | | | | | |
| Sections 1 — 13..... | 724 R.. | 13,346 | New..... | Aug.17,1899 | 233,704.32 | ..... |
| Ashly-Fairview— | | | | | | |
| Section 5..... | 725 R.. | 2,800 | Enlarg'nt. | Feb.20,1900 | 26,094.86 | ..... |
| Section 6..... | 725 R.. | 3,000 | Enlarg'nt. | Nov. 6,1898 | 24,669 54 | ..... |
| Glasscock— | | | | | | |
| Lot 3, Sections 1— 2.. | 725 R.. | 2,100 | Enlarg'nt. | Mar.22,1900 | 22,788.67 | $439,424 27 |

## STATEMENT No. 14.—Continued.

| NAME OF LEVEE | Miles below Cairo | Length of Line Completed | New or Enlargement | Date of Completion | Total Cubic Yards | Total Cost |
|---|---|---|---|---|---|---|
| **Atchafalaya District** | | | | | | |
| Raccourci-Longwood— | | | | | | |
| Sections 6 — 8..... | 785 R.. | 5,820 | Enlarg'nt. | Nov. 9,1898 | 26,133.62 | ..... |
| Fleta— | | | | | | |
| Sections 2 — 3 ..... | 786 R.. | 2,020 | Enlargn't. | Nov.12,1898 | 39,159.42 | ..... |
| New Texas ..... .... .... | 786 R.. | 1,400 | Enlargn't | Aug.17,1898 | 11,136.49 | ..... ... |
| Porche-Morganza— | | | | | | |
| Section 4 ..... | 787 R.. | 4,045 | Enlarg'nt | Oct. 15,1898 | 35,207.58 | ..... |
| Watson..... | 794 R. | 1,702 | N. and E.. | Mar.13,1900 | 43,322.12 | ..... |
| Buquai.... ..... | 794 R.. | 1,376 | New. . ... | Jan. 23,1900 | 31,701.72 | ..... ..... |
| Morrison— | | | | | | |
| Section 7..... | 797 R.. | 900 | Enlarg'nt. | Nov 1,1898 | 18,652,30 | ... ..... |
| Sections 9 — 15 ..... | 797 R.. | 6,671 | Enlargn't. | Dec. 6,1898 | 111,085.04 | ..... |
| Point Coupee— | | | | | | |
| Section 2..... | 798 R. | 1,000 | Enlarg'nt. | Oct. 11,1898 | 14 263.03 | ..... |
| St. Claude ..... .... | 805 R.. | 700 | Enlarg'nt. | Aug.13,1898 | 14,278.72 | ..... |
| Nina— | | | | | | |
| Sections 1 — 8..... | 806 R.. | 8,320 | Enlarg'nt. | July 31,1899 | 137,433.54 | .. .... ... |
| Hermitage— | | | | | | |
| Sections 1 — 3 ..... | 808 R.. | 2,327 | Enlarg'nt. | Mar.21,1900 | 39,223 89 | ..... ..... |
| Highland— | | | | | | |
| Sections 1 — 4..... | 815 R. | 4,343 | Enlarg'nt. | Nov. 2,1898 | 73,344.37 | ..... |
| Barroza— | | | | | | |
| Sections 3 — 6.. ... | 824 R.. | 3,460 | Enlarg'nt. | Apr 5,1900 | 58,964.43 | ..... |
| Sections 11 — 14..... | 824 R.. | 2,972 | Enlarg'nt. | July 7,1899 | 45,740.29 | ..... |
| Sections 11 — 14..... | 824 R.. | 2,872 | Enlarg'nt. | Mar.11,1900 | 5,535.23 | ..... .. |
| Belle Vale— | | | | | | |
| Sections 1 — 2..... | 826 R.. | 3,388 | Enlarg'nt. | Dec. 16,1898 | 30,056.63 | ..... |
| Viola— | | | | | | |
| Sections 1 — 5.4.... | 828 R.. | 7,326 | Enlarg'nt. | Aug.16,1898 | 76,681.29 | ..... |
| Homestead— | | | | | | |
| Sections 1 — 5..... | 833 R.. | 4,715 | Enlarg'nt. | Mar. 3,1900 | 66,890.65 | ..... |
| Beaulieu-Antonio— | | | | | | |
| Sections 1 — 6 ..... | 836 R.. | 9,244 | N. and E.. | Sep. 19,1899 | 95,015.32 | ..... |
| Cinclare— | | | | | | |
| Sections 1 — 5..... | 837 R.. | 5,100 | Enlarg'nt. | Jan. 20,1900 | 64,113.37 | ..... |
| Brusly— | | | | | | |
| Sections 1 — 5..... | 838 R.. | 4,495 | Enlarg'nt. | Mar. 3,1900 | 67,939.47 | ..... |
| Missouri— | | | | | | |
| Sections 1 — 4..... | 840 R.. | 7,045 | Enlarg'nt. | July 27,1899 | 62,756.86 | ..... |
| St. Delphine— | | | | | | |
| Sections 1 — 4..... | 841 R. | 2,645 | Enlarg'nt. | Feb 21,1900 | 48,219.88 | ..... |
| Australia— | | | | | | |
| Sections 1 — 2..... | 846 R.. | 3,832 | Enlarg'nt. | Aug.24,1899 | 26,343.12 | ..... |
| Robertson— | | | | | | |
| Sections 1 — 2..... | 854 R.. | 1,186 | New..... | Apr. 12,1899 | 36,733.00 | ..... |
| Sections 427—430..... | 870 R.. | 3,125 | Enlarg'nt. | Nov.26,1898 | 12,155.84 | $186,943 23 |
| **Pontchartrain District.** | | | | | | |
| Section 2.. ..... | 835 L.. | 1,751 | Enlarg 'nt. | Apr. 21,1898 | 15,657.29 | ..... |
| Sections 10 — 11..... | 837 L.. | 4,072 | Enlarg 'nt. | Apr. 6,1899 | 7,080.73 | ..... |
| Section 12..... | 837 L.. | 920 | Enlarg 'nt. | Mar.21,1899 | 7,687.05 | ..... |
| Sections 13 — 14..... | 838 L.. | 3,137 | Enlarg 'nt | Mar.23,1899 | 27,278.82 | ..... |
| Sections 15 — 16..... | 839 L.. | 4,158 | Enlarg 'nt. | Nov. 2,1898 | 38,303.99 | ..... |
| Sections 19 — 20..... | 840 L.. | 1,969 | Enlarg 'nt. | Aug. 4, 1898 | 16,960.31 | ..... |
| Section 22..... ..... | 840 L.. | 964 | Enlarg 'nt. | July 25,1898 | 10,027.14 | ..... |
| Sections 24 — 26..... | 841 L.. | 3,820 | Enlarg 'nt. | Sep. 20,1898 | 56,495.05 | ..... |

## STATEMENT No. 14—Continued.

| NAME OF LEVEE | Miles below Cairo | Length of Line Completed | New or Enlargement | Date of Completion | Total Cubic Yards | Total Cost |
|---|---|---|---|---|---|---|
| **Pontchartrain District. Continued.** | | | | | | |
| Sections 34 — 35 | 845 L. | 1,643 | Enlarg 'nt. | Sep. 20,1898 | 14,726.84 | |
| Sections 41 — 47 | 848 L. | 9,985 | Enlarg 'nt. | Mar. 8,1899 | 100,933.34 | |
| Sections 72 — 73 | 854 L. | 3,185 | Enlarg 'nt. | July 19,1899 | 31,731.32 | |
| Section Ex. 72 | 854 L. | 171 | Enlarg 'nt. | July 13,1899 | 1,698 85 | |
| Section 74 | 854 L. | 1,072 | Enlarg 'nt | Apr. 12,1899 | 10,850.82 | |
| Sections 75 — 77 | 854 L. | 3,691 | Enlarg 'nt. | Apr. 29,1899 | 35,529.34 | |
| Section 78 | 854 L. | 1,691 | Enlarg 'nt. | July 28,1899 | 16,874.02 | |
| Sections 81 — 82 | 856 L. | 1,678 | Enlarg 'nt | Aug. 15,1899 | 15,364.79 | |
| Landry | 856 L. | 5,904 | Enlarg 'nt | Mar. 10,1900 | 62,358.44 | |
| Mount Olive | 857 L. | 4,600 | Enlarg 'nt. | Feb. 15,1900 | 60,947.81 | |
| Sections 97 —103 | 861 L. | 8,354 | Enlarg 'nt | Aug. 15,1899 | 88,513.29 | |
| Golden Gate | 859 L. | 5,884 | Enlarg 'nt. | Mar. 3,1900 | 63,254.32 | |
| Thiery | 864 L. | 1,231 | Enlarg 'nt | Feb. 14,1900 | 12,876.65 | |
| Lorio | 867 L. | 1,020 | Enlarg 'nt. | Jan. 4, 1900 | 11,771.06 | |
| Point Clear— | | | | | | |
| Sections 3 — 5 | 868 L. | 1,801 | Erlarg 'nt. | Mar 28,1900 | 21,428.81 | |
| Leper Home— | | | | | | |
| Section 4 | 870.5 L. | 1,000 | Enlarg 'nt. | Mar. 20,1900 | 13,033.45 | |
| Hard Times— | | | | | | |
| Sections 1 — 2 | 872 L. | 2,300 | Enlarg 'nt. | Mar. 17,1900 | 28,179.24 | $100,949 32 |
| **Lake Borgne District.** | | | | | | |
| Chalmette— | | | | | | |
| Section 1 | 972 L. | 3,000 | Enlarg 'nt. | Nov. 28,1899 | 12,025.39 | |
| Section 2 | 972 L. | 2,400 | Enlarg 'nt. | Nov. 30,1899 | 13,767.91 | |
| Corinne— | | | | | | |
| Sections 1 — 5 | 974 L. | 15,678 | New&Enlg | Nov. 30,1899 | 90,940.57 | |
| Story-Caernarvon— | | | | | | |
| Sections 3 — 4 | 977 L. | 8,300 | Enlarg 'nt. | Oct. 29,1898 | 45,854.06 | |
| Caernarvon— | | | | | | |
| Sections 1 — 3 | 977 L. | 1,859 | New&Enlg | Nov. 4, 1899 | 43,455.21 | |
| Poydras— | | | | | | |
| Sections 1 — 2 | 978 L. | 5,679 | Enlarg 'nt. | Dec. 30,1899 | 28,761.83 | |
| Kenilworth— | | | | | | |
| Sections 1, 3 and 4 | 980 L. | 3,655 | Enlarg 'nt. | Mar. 29,1900 | 26,908.26 | |
| Bertrandville | 981 L. | 398 | Enlarg 'nt. | Mar. 10,1900 | 2,474.86 | |
| St. Clair | 982 L. | 9,640 | Enlarg 'nt. | Mar 10,1900 | 47,215.81 | |
| Mary | 989 L. | 1,451 | Enlarg 'nt. | Oct. 25,1899 | 16,504.92 | $52,656 47 |
| Harris— | | | | | | |
| Section 1 | 1013 L. | 2,400 | Enlarg 'nt. | Mar. 10,1900 | 16,121.31 | |
| Section 2 | 1013 L. | 2,861 | Enlarg 'nt. | Jan. 3, 1900 | 17,623.89 | $4,731.83 |
| **Lafourche District.** | | | | | | |
| Jamestown | 898 R. | 2,167 | Enlarg 'nt. | Mar. 12,1900 | 22,076.41 | |
| Oak Alley— | | | | | | |
| Sections 2, 3 and 5 | 907 R. | 3,580 | Enlarg 'nt. | Mar. 24,1900 | 46,508.99 | |
| Waugespack— | | | | | | |
| Sections 1 — 4 | 914 R. | 10,353 | Enlarg 'nt. | Sep. 24,1898 | 63,113.20 | |
| Willowgrove— | | | | | | |
| Section 1 | 917 R. | 1,695 | Enlarg 'nt | Mar. 21,1900 | 13,160.09 | |
| Stevenson— | | | | | | |
| Section 1 | 919 R. | 2,700 | Enlarg 'nt. | Dec. 29,1898 | 15,421.56 | |
| Sections 2 — 3 | 919 R. | 5,161 | Enlarg 'nt. | Mar. 3,1899 | 32,273.82 | |

## STATEMENT No. 14.—Continued.

| NAME OF LEVEE | Miles below Cairo | Length of Line Completed | New or Enlargement | Date of Completion | Total Cubic Yards | Total Cost |
|---|---|---|---|---|---|---|
| **Lafourche District—Continued.** | | | | | | |
| Alliance— | | | | | | |
| Section 2 | 920 R.. | 2,349 | Enlarg'nt. | Jan. 6,1900 | 16,288.18 | ..... |
| Hymelia-Killona— | | | | | | |
| Sections 1 — 5 | 930 R.. | 11,560 | Enlarg'nt. | Mar.20,1900 | 91,298.11 | ..... |
| Pelican-Flagtown— | | | | | | |
| Sections 1 — 5 | 936 R.. | 12,516 | Enlarg'nt. | Oct. 4,1899 | 90,784.72 | ..... |
| Lone Star | 942 R.. | 2,051 | Enlarg'nt. | Feb.23,1900 | 16,972.84 | ..... |
| Louisa— | | | | | | |
| Sections 1 — 2 | 943 R.. | 5.652 | Enlarg'nt. | Aug. 8,1899 | 37,232.82 | ..... |
| Coopersville | 944 R.. | 2,642 | Enlarg'nt. | Sep. 19,1899 | 11,007.69 | ..... |
| **Barataria District.** | | | | | | |
| Upper Magnolia— | | | | | | |
| Section 1 | 970 R.. | 2,251 | Enlarg'nt. | Feb.28,1900 | 12,728.02 | ..... |
| Section 2 | 979 R.. | 2,382 | Enlarg'nt. | Dec.28,1899 | 12,189.32 | ..... |
| Little Rock | 980 R.. | 1,778 | Enlarg'nt. | Oct. 31,1899 | 6,592.15 | ..... |
| Belle Chasse— | | | | | | |
| Sections 1 — 2 | 982 R.. | 4,532 | Enlarg'nt. | Feb. 1.1900 | 30 570.78 | ..... |
| St. Ann | 985 R.. | 2,782 | Enlarg'nt. | Oct. 16,1899 | 12,601.73 | ..... |
| Alliance | 988 R.. | 2,180 | Enlarg'nt. | Feb. 2,1900 | 12,629.18 | ..... |
| St. Rosalie | 999 R. | 4,734 | Enlarg'nt. | Nov. 6,1899 | 46,788.73 | ..... |
| St. Rosalie-Irontown— | | | | | | |
| Sections 1 — 2 | 1000 R.. | 2,690 | Enlarg'nt. | Feb.20,1900 | 20,326.72 | ..... |
| Deer Range | 1005 R.. | 1,600 | Enlarg'nt. | Jan. 14,1899 | 5 711.80 | ..... |
| Magnolia | 1013 R.. | 4,306 | Enlarg'nt. | Oct. 25,1899 | 16,255 31 | $83,773.85 |
| Treadaway | 1019 R.. | 1,757 | New ..... | Jan. 21,1899 | 12,255.98 | ..... |
| Butler | 1019 R.. | 510 | Enlarg'nt. | Jan. 4,1899 | 2,083.74 | ..... |
| Mallay-Orange Farm.— | | | | | | |
| Sections 3 — 4 | 1023 R.. | 4,190 | N. and E.. | Dec. 2,1899 | 21,290.50 | ..... |
| Ballay— | | | | | | |
| Section 5 | 1023 R.. | 2,139 | N. and E.. | Sep. 1,1898 | 16,209.63 | ..... |
| Orange Farm | 1024 R.. | 900 | New ..... | Mar.21,1899 | 8,281.67 | ..... |
| Section 1 | 1024 R.. | 1,464 | New ..... | Jan. 5,1900 | 12,975.97 | ..... |
| Section 2 | 1024 R.. | 2,341 | New ..... | Jan. 8,1900 | 15,557.78 | ..... |
| Nairn— | | | | | | |
| Sections 2 — 3 | 1024 R.. | 6.888 | Enlarg'nt. | June20,1899 | 27,773.30 | ..... |
| Nairn Extension | 1025 R.. | 1,225 | Enlarg'nt. | Feb.17,1900 | 8,236.74 | ..... |
| Pelas | 1032 R. | 1,616 | Enlarg'nt. | Jan. 23,1900 | 6,931.01 | ..... |
| Rodey | 1035 R.. | 3,303 | Enlarg'nt | Jan. 28,1900 | 16,785.05 | ..... |
| Rodey Extension— | | | | | | |
| Sections 1 — 2 | 1036 R . | 3,170 | Enlarg nt. | Mar. 1,1900 | 12,993.62 | ..... |
| Reddick | 1038 R.. | 1,544 | New ..... | Jan. 8,1900 | 10,400.33 | ..... |
| Booth | 1039 R.. | 2,021 | Enlarg'nt. | Nov.22,1899 | 9,371.92 | $24,874.62 |

## APPENDIX A. STATEMENT

The Board of State Engineers is indebted to the courtesy of Major following statement showing levee work on Red River, under- to April 20, 1900.

| NAME OF CONTRACT | PARISH | DATE OF | | LINEAR FEET | |
|---|---|---|---|---|---|
| | | Contract | Final Certificate | New Levee | Enlargement |
| Choctaw Bayou Levee Stations 0 to 160 | Avoyelles | Aug. 25, 1898 | Jan. 7, 1899 | 10,000 | |
| Hervey Canal Levee | Caddo | Sep. 9, 1898 | May 31, 1899 | 10,886 | |
| Extra work:—Excavating below grade (6,25 cubic yards) to obtain secure foundation for line of embankment crossing Hervey Canal | | | | | |
| Building pile bulkhead at Station 225, the upper terminus of levee | | | | | |
| Bridging traverse ditches opposite ramps crossing the levee | | | | | |
| Totals | | | | | |
| Tones Bayou Dam | Caddo | July 14, 1899 | Nov. 7, 1899 | 825 | |
| Scott Slough Levee | Caddo | Aug. 15, 1899 | Feb. 9, 1900 | 10,205 | |
| Building pile bulkhead at Station 827, the upper terminus of levee | | | | | |
| Total | | | | | |
| Choctaw Bayou Levee | Avoyelles | Aug. 16, 1899 | Nov. 7, 1899 | | |

No. 15. UNITED STATES LEVEES.

Thos. L. Casey, Corps of Engineers, United States Army, for the
taken by the United States, during the two years, from April 21, 1898,

| Cubic Yards | Price—Cents | Cost | REMARKS |
|---|---|---|---|
| 66.445 | 9 1/5 | $6,201 53 | Stations 100 — 254+70 built by State at same time. |
| 247,400 | 14 8/10 | $36,615 20 | |
| ..... | ..... | 1,376 02 | |
| ..... | ..... | 450 00 | |
| .... ..... | ... .... | 20 50 | |
| ..... | ..... | $38,461 72 | |
| 43,916 | 5 | $2,195 80 | Price of work was 15 45/100 cts. per cubic yard. Balance of $4,589 22 paid by State. |
| 251,511 | 21 84/100 | $54,930 00 | |
| ..... | ..... | 376 00 | |
| .... ..... | ..... | $55,306 00 | |
| ..... .. | ..... | $2,547 00 | Repair work. Restoring levee to grade and regrassing same, from Station 0 to 254+70, at $10 per station of 100 feet. |

## APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several Levee
from April 20, 1898 to April 20, 1900, by the Districts, State

| LEVEE DISTRICT | BY WHOM DONE | MILES OF | |
|---|---|---|---|
| | | New Levee | Enlargement |
| Arkansas | Tensas Basin Levee District, through U. S. Engineers | 0.43 | 0.95 |
| | Tensas Basin Levee District | 0.24 | 4.83 |
| | United States | 0.37 | 65.06 |
| | Arkansas Levee Board | 0.70 | 1.13 |
| | Totals | 1.74 | 71.97 |
| Louisiana—Fifth Louisiana Levee District | District | 4.05 | 19 82 |
| | State | 2.75 | 1 70 |
| | United States | 16.18 | 37.38 |
| | Totals | 22.98 | 58.90 |
| Atchafalaya Basin Levee District | District | 8.91 | 60 22 |
| | State | 1.30 | 3.80 |
| | United States | 0.96 | 18.36 |
| | Totals | 11.17 | 82.38 |
| Pontchartrain Levee District | District | 0.04 | 1.36 |
| | State | 0.42 | 2.61 |
| | United States | ..... | 14.39 |
| | Totals | 0.46 | 18.36 |
| Lafourche Basin Levee District | District | 13.02 | 8.12 |
| | State | 2.11 | ..... |
| | United States | ..... | 17.36 |
| | Totals | 15.13 | 25.48 |
| Orleans Levee District | District | 1.23 | 1.08 |
| | Totals | 1.23 | 1 08 |
| Lake Borgne Basin Levee District | State | 0.67 | 1.69 |
| | United States | 0.10 | 9.86 |
| | Totals | 0.77 | 11.55 |
| Buras Levee District | District | 0.08 | 0.10 |
| | State | 1.10 | 2.83 |
| | United States | 2 20 | 4.06 |
| | Totals | 3.38 | 6.99 |

## No. 16. SUMMARY ACCORDING TO DISTRICTS.

Districts of Louisiana, and in Desha and Chicot counties, Arkansas, and United States, as shown in the foregoing Statements.

| Cubic Yards | Average Price per Cubic Yard—Cents | Expenditures | REMARKS |
|---|---|---|---|
| 93,498 | ..... | $17,487 82 | |
| 234,334 | 17.64 | 41,288 51 | |
| 1,673,427 | ..... | 250,773 89 | |
| 132,762 | ..... | 22,029 45 | |
| 2,134,021 | ..... | $331,529 67 | |
| 1,133,338 | 16.06 | $181,992 22 | |
| 581,754 | 15.24 | 88,653 70 | |
| 4,141,590 | ..... | 781,514 67 | |
| 5,856,682 | ..... | $1,052,160 59 | |
| 3,238,195 | 16.43 | $532,227 22 | |
| 285,683 | 15.36 | 43,871 83 | |
| 1,292,087 | ..... | 186,943 23 | |
| 4,815,965 | ..... | $763,042 28 | |
| 29,159 | 18.91 | $5,520 26 | |
| 160,980 | 19.78 | 31,846 42 | |
| 769,562 | ..... | 100,949 32 | |
| 959,701 | ..... | $138,316 00 | |
| 1,458,558 | 15.66 | $228,539 29 | |
| 266,449 | 13.23 | 35,241 03 | |
| 632,532 | ..... | 83,773 85 | |
| 2,357,539 | ..... | $347,554 17 | |
| 156,446 | 15.43 | $24,141 02 | |
| 156,446 | ..... | $24,141 02 | |
| 65,273 | 14.21 | $9,270 37 | |
| 327,909 | ..... | 52,656 47 | |
| 393,182 | ..... | $61,926 84 | |
| 3,747 | 15.15 | $416 15 | |
| 63,696 | 13.06 | 8,322 09 | |
| 181,146 | ..... | 24,874 62 | |
| 248,589 | ..... | $33,612 86 | |

## APPENDIX A. STATEMENT

| LEVEE DISTRICT | BY WHOM DONE | MILES OF | |
|---|---|---|---|
| | | New Levee | Enlargement |
| Grand Prairie Levee District | District | 5.16 | ..... |
| | State | 3.05 | 5.57 |
| | United States | ..... | 1.00 |
| | Totals | 8.21 | 1.57 |
| Caddo Levee District | State | 4.50 | 3.39 |
| | United States | 3.83 | ..... |
| | Totals | 8.33 | 3.39 |
| Bossier Levee District | District | 1.58 | ..... |
| | State | 5.41 | 0.75 |
| | Totals | 6.99 | 0.75 |
| Red River, Atchafalaya and Bayou Bœuf Levee District | District | 5.46 | 0.09 |
| | State | 4.27 | 6.72 |
| | United States | 1.89 | ..... |
| | Totals | 11.62 | 6.81 |
| RECAPITULATION | | | |
| Arkansas Levee Boards | | 0.70 | 1.13 |
| Districts | | 40.20 | 96.57 |
| State | | 25.58 | 24.06 |
| United States | | 25.53 | 167.47 |
| Totals | | 92.01 | 289.23 |

## No. 16.—Cont'd. SUMMARY ACCORDING TO DISTRICTS.

| Cubic Yards | Average Price per Cubic Yard—Cents | Expenditures | REMARKS |
|---|---|---|---|
| 64,721 | ..... | $8,603 56 | |
| 62,829 | 12.29 | 7,715 24 | |
| 33,745 | ..... | 4,731 83 | |
| 161,295 | ... | $21,050 63 | |
| 340,442 | 10.02 | $34,119 30 | |
| 498,911 | ..... | 93,767 72 | |
| 839,353 | ..... | $127,887 02 | |
| 119,140 | 13.20 | $15,726 48 | |
| 216,644 | 9.28 | 20,110 83 | |
| 335,784 | ..... | $35,837 31 | |
| 209,307 | 8.96 | $18,768 83 | |
| 258,217 | 12.75 | 32,928 47 | |
| 66,445 | ..... | 6,201 53 | |
| 533,969 | ..... | $57,898 83 | |
| 132,762 | ..... | $22,029 45 | |
| 6,740,443 | ... . | 1,074,661 36 | |
| 2,301,967 | ..... | 312,079 28 | |
| 9,617,354 | ..... | 1,586,187 13 | |
| 18,792,526 | .. .... | $2,994,957 22 | |

## APPENDIX A. STATEMENT

Approximate quantity and cost of levee work in the several Levee from April 20, 1898, to April 20, 1900, by the Districts,

| STREAM | LEVEE DISTRICT | BY WHOM DONE | MILES OF New Levee | MILES OF Enlargement |
|---|---|---|---|---|
| Arkansas River..... | Tensas Basin..... | District..... ..... | 0.43 | ..... |
| | | Arkansas Levee Boards.. | 0.70 | ..... |
| | | United States ..... | 0.37 | 12.40 |
| | | Totals ..... ... | 1.50 | 12.40 |
| Mississippi River in Arkansas ..... | Tensas Basin..... | Arkansas Levee Boards.. | ..... | 1.13 |
| | | District..... | 0.24 | 5.78 |
| | | United States .... | ..... | 52.66 |
| | | Totals ..... | 0.24 | 59.57 |
| Mississippi River in Louisiana..... | Fifth Louisiana.. | District... ..... | 4.05 | 19.82 |
| | | State..... | 2.75 | 1.70 |
| | | United States..... | 16.18 | 37.38 |
| | | Totals ..... | 22.98 | 58.90 |
| | Atchafalaya Basin.... | District..... | 2.22 | 22.18 |
| | | State ..... | 1.30 | 3.80 |
| | | United States..... | 0.96 | 18.36 |
| | | Totals ..... | 4.48 | 44.34 |
| | Pontchartrain.... | District..... | 0.04 | 1.86 |
| | | State..... | 0.42 | 2.61 |
| | | United States..... | ..... | 14.39 |
| | | Totals ..... | 0.46 | 18.36 |
| | Lafourche Basin.. | District. ..... | 1.81 | 2.59 |
| | | State ..... ... | 2.05 | ..... |
| | | United States..... | ..... | 17.36 |
| | | Totals .... .... | 3.86 | 19.95 |
| | Orleans..... | District..... | 1.23 | 1.08 |
| | | Totals ..... | 1.23 | 1.08 |
| | Lake Borgne Basin..... | State... ..... | 0.67 | 1 69 |
| | | United States..... | 0.10 | 9.86 |
| | | Totals ..... | 0.77 | 11.55 |
| | Grand Prairie.... | District ..... | 5.16 | ..... |
| | | State..... | 3.05 | 0.57 |
| | | United States... .. | ..... | 1.00 |
| | | Totals ..... | 8.21 | 1.57 |
| | Buras..... | District..... | 0.08 | 0.10 |
| | | State..... .. ... | 1.10 | 2.83 |
| | | United States..... | 2.20 | 4.06 |
| | | Totals ..... | 3.38 | 6.99 |

## No. 17. SUMMARY ACCORDING TO STREAMS.

Districts of Louisiana, and in Desha and Chicot Counties Arkansas, State, and United States, as shown in foregoing statements.

| Cubic Yards | Expenditures | REMARKS |
|---|---|---|
| 83,597 | $14,999 94 | |
| 115,625 | 18,000 12 | |
| 153,942 | 29,512 07 | |
| 353,164 | $62,512 13 | |
| 17,137 | $4,029 33 | |
| 244,235 | 43,726 39 | |
| 1,519,485 | 221,261 82 | |
| 1,780,857 | $269.017 54 | |
| 1,133,338 | $181,992 22 | |
| 581,754 | 88,658 70 | |
| 4,141,590 | 781,514 67 | |
| 5,856,682 | $1,052,160 59 | |
| 1,375,106 | $238,495 82 | |
| 285,683 | 43,871 83 | |
| 1,292,087 | 186,943 23 | |
| 2,952,876 | $469,310 88 | |
| 29,159 | $5,520 26 | |
| 160,980 | 31,846 42 | |
| 769,562 | 100,949 32 | |
| 959,701 | $138,316 00 | |
| 241,744 | $42,638 27 | |
| 261,251 | 34,596 48 | |
| 632,532 | 83,773 85 | |
| 1,135,527 | $161,008 60 | |
| 156,446 | $24,141 02 | |
| 156,446 | $24,141 02 | |
| 65,273 | $9,270 37 | |
| 227,909 | 52,656 47 | |
| 393,182 | $61,926 84 | |
| 64,721 | $8,603 56 | |
| 62,829 | 7,715 24 | |
| 33,745 | 4,731 83 | |
| 161,295 | $21,050 63 | |
| 3,747 | $416 15 | |
| 63,696 | 8,822 09 | |
| 181,146 | 24,874 62 | |
| 248,589 | $33,612 86 | |

## APPENDIX A. STATEMENT

| STREAM | LEVEE DISTRICT | BY WHOM DONE | MILES OF | |
|---|---|---|---|---|
| | | | New Levee | Enlargement |
| Red River | Caddo | State | 4.50 | 3.39 |
| | | United States | 3.83 | |
| | | Totals | 8.33 | 3.39 |
| | Bossier | District | 1.58 | |
| | | State | 5.41 | 0.75 |
| | | Totals | 6.99 | 0.75 |
| | R. R., A. & B. B. | State | 4.18 | |
| | | United States | 1.89 | |
| | | Totals | 6.07 | |
| Bayou Rapides | R. R., A. & B. B. | State | | 1.40 |
| | | Totals | | 1.40 |
| Bayou des Glaizes | R. R., A. & B. B. | District | 5.46 | 0.09 |
| | | State | 0.05 | 1.80 |
| | | Totals | 5.51 | 1.89 |
| Atchafalaya River | R. R., A. & B. B. | State | 0.04 | 3.52 |
| | | Totals | 0.04 | 3.52 |
| | Atchafalaya Basin | District | 1.16 | 10.20 |
| | | Totals | 1.16 | 10.20 |
| Bayou Lafourche | Atchafalaya Basin | District | 5.53 | 27.84 |
| | | Totals | 5.53 | 27.84 |
| | Lafourche Basin | District | 11.21 | 5.53 |
| | | State | 0.06 | |
| | | Totals | 11.27 | 5.53 |

### RECAPITULATION

| | | |
|---|---|---|
| On the Arkansas River | 1.50 | 12.40 |
| On the Mississippi River (in Arkansas) | 0.24 | 59.57 |
| On the Mississippi River (in Louisiana) | 45.37 | 162.74 |
| On the Red River | 21.39 | 4.14 |
| On Bayou Rapides | | 1.40 |
| On Bayou des Glaizes | 5.51 | 1.89 |
| On the Atchafalaya River | 1.20 | 13.72 |
| On Bayou Lafourche | 16.80 | 33.37 |
| Totals | 92.01 | 289.23 |

17. Cont'd. SUMMARY ACCORDING TO STREAMS.

| Cubic Yards | Expenditures | REMARKS |
|---|---|---|
| 340,442 | $34,119 80 | |
| 498,911 | 93,767 72 | |
| 839,353 | $127,887 02 | |
| 119,140 | $15,726 48 | |
| 216,644 | 20,110 83 | |
| 335,784 | $35,837 31 | |
| 128,045 | $11,788 39 | |
| 66,445 | 6,201 53 | |
| 194,490 | $17,989 92 | |
| 36,357 | $8,863 83 | |
| 36,357 | $8,863 83 | |
| 209,307 | $18,768 83 | |
| 22,877 | 3,113 01 | |
| 232,184 | $21,881 84 | |
| 70,938 | $9,163 24 | |
| 70,938 | $9,163 24 | |
| 283,762 | $49,326 71 | |
| 283,762 | $49,326 71 | |
| 1,579,327 | $244,404 69 | |
| 1,579,327 | $244,404 69 | |
| 1,216,814 | $185,901 02 | |
| 5,198 | 644 55 | |
| 1,222,012 | $186,545 57 | |
| 353,164 | $62,512 13 | |
| 1,780,857 | 269,017 54 | |
| 11,864,298 | 1,961,527 42 | |
| 1,369,627 | 181,714 25 | |
| 36,357 | 8,863 83 | |
| 232,184 | 21,881 84 | |
| 354,700 | 58,439 95 | |
| 2,801,339 | 430,950 26 | |
| 18,792,526 | $2,994,957 22 | |

# APPENDIX B.

**Tabular Statement Relative to the Bond Issues of the Several Levee Districts, and the Annual Gross Resources of the State and Levee Districts for Levee Purposes.**

## APPENDIX B. BOND

**Statement relative to the bond issue of the several Levee Districts and of the several Levee Districts, for levee purposes, under existing based upon returns for 1899.**

| SOURCES OF REVENUE | LAWS | AMENDMENTS | BONDS | | |
|---|---|---|---|---|---|
| | | | Amount Authorized | Rate of Interest | Amount Outstanding (State Auditor) |
| (a) From the State at large (i. e., from the General Engineer Fund) | No. 33 of '79 | No. 44 of '86<br>No. 97 of '90<br>No. 13 of '92<br>No. 14 of '92<br>No. 18 of '94 | ..... | ..... | ..... |
| From the regular Levee Districts, viz: | | | | | |
| Atchafalaya Basin | No. 97 of '90 | ..... | $1,000,000 | 6% | $850,000 |
| Bossier | No. 89 of '92 | No. 104 of '94 | 200,000 | 6% | 199,900 |
| Buras | No. 18 of '94<br>No. 97 of '98 | No. 80 of '98<br>..... | 35,000 | 6% | 25,000 |
| Caddo | No. 74 of '92 | No. 90 of '94 | 200,000 | 6% | 199,800 |
| Cat Island | No. 110 of '94 | ..... | 100,000 | 6% | ..... |
| Fitfth Louisiana | No. 44 of '86 | No. 160 of '90<br>No. 4 of '92<br>No. 48 of '94<br>No. 11 of '98 | 500,000 | 6% | 460,000 |
| Grand Prairie | No. 24 of '98 | ..... | 25,000 | 6% | 20,000 |
| Lafourche Basin | No. 13 of '92 | No. 100 of '92<br>No. 175 of '94<br>No. 19 of '94 | 500,000 | 6% | 275,000 |
| Lake Borgne | No. 14 of '92 | ..... | 100,000 | 6% | 100,000 |
| Orleans | No. 93 of '90<br>No. 116 of '98 | No. 79 of '92<br>..... | 500,000 | 5% | 325,000 |
| Pontchartrain | No. 95 of '90<br>No. 59 of '94 | No. 68 of '92 & No. 96 of '94<br>..... | 1,044,000 | 6% | 786,000 |
| Red River, Atchafalaya and Bayou Bœuf | No 46 of '92 | ..... | 250,000 | 6% | 250,000 |
| Tensas Basin | No. 59 of '86 | No. 77 of '88<br>No. 103 of '92<br>No. 70 of '94<br>No. 117 of '98 | 150,000 | 6% | 90,500 |
| Totals | | | $4,604,000 | | $3,581,200 |

(a) Under Act No 102, of 1892 the General Engineer Fund is distributed as follows:

| | | GROSS AMOUNT |
|---|---|---|
| To the Orleans Levee District | | $10,000 00 |
| To the Tensas Basin Levee District | 10 % | 20,902 36 |
| To the Caddo Sub-District Fund | 9½% | 19,857 24 |
| To the Natchitoches Sub-District Fund | 3½% | 7,315 82 |
| To the other Levee Districts | 77 % | 160,948 15 |
| Under Act No 55, of 1898, the annual appropriations against the General Enginder Fund amount to | | 48,700 00 |
| Total, as above | | $267,723 57 |

(b) "One dollar ($1.00) on each and every arpent front of land within the said District

ISSUE, ETC.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 20, 1900.

of the State of Louisiana, and the annual gross resources of the State laws, with estimated gross amounts of taxes and local assessments,

| MILL TAX | | ACREAGE, RAILROAD AND PRODUCE ASSESSMENTS | | | | GROSS ANNUAL REVENUES |
|---|---|---|---|---|---|---|
| Rate Permitted (Mills) | Gross Amount (State Auditor) | Rate Permitted (cents per acre) | Rate Permitted ($ per mile) | Gross Amounts of Railroad and Acreage Assessments (State Auditor) | Amount of Produce Assessment Collected in 1899 (State Auditor) | |
| 1 | $267,723 57 | ..... | ..... | ..... | ..... | $267,723 57 |
| 10 | 139,818 64 | 2½ | 60 | $47,295 42 | $75,585 12 | 262,699 18 |
| 10 | 11,137 00 | 5 | 60 | 7,608 50 | 6,988 74 | 25,734 24 |
| 10 | 4,044 45 | 5 | 30 | 1,219 20 | 3,001 93 | 8,265 58 |
| 10 | 7,134 80 | 5 | 60 | 5,580 50 | 8,596 75 | 21,312 05 |
| 10 | (None Assessed) | 2½ | 100 | (None Assessed) | (None Assessed) | ..... |
| 10 | 53,552 14 | 5 | 20, 30 & 60 | 50,274 55 | 54,810 50 | 158,637 19 |
| 10 | 1,435 05 | (b) | 30 | 552 60 | 552 78 | 2,540 43 |
| 10 | 94,470 88 | 2½ | 50 & 100 | 26,288 60 | 50,578 57 | 171,338 05 |
| 10 | 15,785 29 | 5 | 60 | 4,501 60 | 3,373 70 | 23,660 59 |
| 1 | 138,702 84 | (None Authorised) | | ..... | ..... | 138,702 84 |
| 10 | 52,283 11 | 3 | 100 | 17,515 00 | 36,043 39 | 105,841 50 |
| 10 | 31,722 10 | 5 | 60 | 21,792 80 | (None Authorised) | 53,514 90 |
| 10 | 12,479 22 | 5 | 30 to 60 | (None Returned) | (None Authorised) | 12,479 22 |
| | $830,589 09 | | | $182,628 77 | $239,531 48 | $1,252,149 34 |

facing the Mississippi River."

# APPENDIX C.

**Tabular Statements of Length and Elevation above High Water of Existing Leveo Line on the Mississippi River in Louisiana, with Estimated Earthwork Required to Raise and Enlarge Same, or to Build New Levees where necessary.**

# APPENDIX C.

## ELEVATION OF EXISTING LEVEE LINES ABOVE HIGH WATER OF 1897, AND ESTIMATES OF EARTHWORK REQUIRED.

Revised statement showing approximate elevation above high water of 1897, of levees in the Fifth Louisiana Levee District, above, and also approximate quantity of earthwork in cubic yards required to place said line to a height of not less than three (3) feet above high water of 1897, with a crown of eight (8) feet, and slopes of 3 and 3 to 1.

The stations given for different stretches of levee are according to the United States Engineers' enumeration at date of continuous survey, and where lengths of line in feet disagree with length between stations, such stretches are covered by new levee locations and length of new levee is used.

| NAME OF LEVEE | STATIONS | Length in feet | Above high water of 1897—Feet | Cubic yards required for 3 feet grade | REMARKS |
|---|---|---|---|---|---|
| East Carroll Parish. | | | | | |
| Ashton | 0 to 190 | 19,000 | 2 | 67,000 | |
| Newcomb | 190 to 256 | 6,600 | 2 | 23,000 | |
| Bunche's Bend | 256 to 755 | 49,900 | 2 | 154,000 | |
| Opossum Point | 755 to 850 | 9,500 | 2 | 29,000 | |
| Wilson Point | 850 to 930 | 8,000 | 2 | 28,000 | |
| Wilson Point to Cottonwood | 930 to 1060 | 13,000 | 3 | ..... | |
| New Cottonwood | 1060 to 1127+21 | 7,547 | 3 | ..... | New levee. |
| Donna Vista | 1127+21 to 1190 | 6,279 | 2 | 25,000 | Badly wave-washed. |
| Longwood | 1190 to 1302+70 | 11,270 | 2 | 71,000 | 4 feet crown and slack slopes. |
| New Elton | 1302+70 to 1348 | 6,070 | 3 | ..... | New levee. |
| Elton | 1348 to 1459 | 11,100 | 3 | ..... | |
| River Bayou | 1459 to 1488 | 2,900 | 2 | 10,000 | Considerably wave-washed. |
| Lake Providence | 1488 to 1540 | 5,200 | 2 | 18,000 | |
| Phil. McGuire | 1540 to 1572 | 3,200 | 2 | 13,000 | |
| Haggaman | 1572 to 1587+40 | 1,540 | 2 | 5,000 | |
| Cohn | 1587+40 to 1606+12 | 1,872 | 2 | 9,000 | Wave-washed. |
| Hugh McGuire | 1606+12 to 1636 | 2,988 | 2 | 15,000 | Badly wave-washed. |
| Desona | 1636 to 1680 | 4,400 | 3 | ..... | |
| Wyly | 1680 to 1725 | 4,500 | 3 | ..... | |
| Blue Ridge | 1725 to 1840 | 11,500 | 3 | ..... | |
| Point Lookout | 1840 to 1986 | 14,600 | 3 | ..... | |
| Homestead | 1986 to 2090 | 10,410 | 1 | 52,000 | |
| Atherton | 2090 to 2140 | 5,000 | 2 | 14,000 | |
| Sauve Terre | 2140 to 2179 | 3,900 | 2 | 11,000 | |
| Transylvania | 2179 to 2202 | 2,300 | 1 | 15,000 | |
| Stamboul | 2202 to 2264 | 6,200 | 1 | 37,000 | |
| Wilton | 2264 to 2286 | 2,200 | 2 | 7,000 | |
| Melbourne | 2286 to 2368 | 8,200 | 2 | 36,000 | |
| Airlie | 2368 to 2411 | 4,300 | 3 | ..... | |
| Illawara | 2411 to 2527 | 11,600 | 3 | ..... | |
| Salem | 2527 to 2600 | 7,300 | 3 | ..... | |
| New Salem | 2600 to 2640 | 3,500 | 3 | ..... | New levee. |
| Pecan Grove | 2640 to 2748 | 10,800 | 1 | 42,000 | |
| Henderson | 2748 to 2810 | 6,200 | 1 | 23,000 | |
| Villa Vista | 2810 to 2931 | 12,100 | 3 | ..... | |

## FIFTH LOUISIANA LEVEE DISTRICT—Continued.

| NAME OF LEVEE | STATIONS | | Length in feet. | Above high water of 1897—Feet | Cubic yards required for 3 feet grade | REMARKS |
|---|---|---|---|---|---|---|
| **Madison Parish.** | | | | | | |
| Mascot | 2931 | to 3031 | 10,000 | 3 | | |
| Ditchley | 3031 | to 3118 | 8,700 | 3 | | |
| Buckhorn | 3118 | to 3197 | 7,900 | 3 | | |
| Rose Hill | 3197 | to 3277 | 8,000 | 3 | | |
| New Morancy | 3277 | to 3310 | 3,176 | 3 | | New levee. |
| Milliken Bend to Cabinteele | 3310 | to 3351 | 24,100 | 3 | | |
| Cabinteele | 3551 | to 3680 | 8,100 | 3 | 21,000 | Scant Section. |
| New Sparta | 3680 | to 3734 | 5,400 | 3 | | New levee. |
| Duckport | 3734 | to 3762+60 | 2,160 | 1 | 15,000 | |
| Nebraska | 3762+60 | to 3839 | 7,640 | 3 | | |
| Willow Slough | 3839 | to 3943 | 10,400 | 3 | | |
| Killarney | 3943 | to 4011 | 6,800 | 3 | | |
| Carolina | 4011 | to 4166+50 | 15,550 | 3 | | |
| New Delta | 4166+50 | to 4200+34 | 3,284 | 3 | | |
| Delta | 4200+34 | to 4226 | 2,566 | 3 | | |
| Delta to O'Brien | 4226 | to 4324 | 9,800 | 3 | | |
| O'Brien to Martin | 4324 | to 4397 | 6,300 | 2 | 30,000 | |
| New Martin Loop | 4397 | to 4420 | 2,254 | 3 | | New levee. |
| Upper Biggs | 4420 | to 4432 | 1,200 | 3 | | |
| New Biggs | 4432 | to 4504 | 7,495 | 3 | | New levee. |
| Reid (upper) | 4504 | to 4539 | 3,500 | 3 | | Being enlarged under U. S. contract. |
| Reid (middle) | 4539 | to 4550 | 1,100 | 3 | | Being enlarged under U. S. contract. |
| Reid (lower) | 4550 | to 4619 | 6,900 | 3 | | Being enlarged under U. S. contract. |
| **Lower end of U. S. Upper Tensas District and beginning of Lower Tensas District.** | | | | | | |
| **Madison Parish—Cont** | | | | | | |
| New Bedford | 0 | to 63 | 5,182 | 3 | | New levee. |
| Christmas | 63 | to 259 | 19,600 | 3 | | |
| Diamond Island | 259 | to 432 | 17,300 | 3 | | |
| Bayou Roundaway | 432 | to 540 | 10,800 | 3 | | |
| **Tensas Parish** | | | | | | |
| Bayou Vidal | 540 | to 618 | 7 800 | 3 | | |
| Ion and Woodburn | 618 | to 806 | 18,800 | 3 | | |
| Somerset | 806 | to 962 | 15,600 | 3 | | |
| Perkins | 962 | to 1138 | 17,600 | 3 | | |
| Bland | 1138 | to 1198 | 6,000 | 3 | | |
| Burn | 1198 | to 1267 | 6,900 | 3 | | |
| Point Pleasant | 1267 | to 1345 | 7,800 | 3 | | |
| Buck Ridge | 1345 | to 1462 | 11,700 | 3 | | |
| Elk Ridge | 1462 | to 1670 | 20,800 | 3 | | |
| White Oak Lake | 1670 | to 1839 | 16,900 | 3 | | |
| Morris | 1839 | to 1855 | 1,600 | 1 | 11,000 | |
| Lake St. Joseph | 1855 | to 1895 | 4,000 | 2 | 16,000 | |
| New Hardtimes | 1895 | to 1905 | 710 | 3 | | |
| Evergreen | 1905 | to 1992 | 8,700 | 5 | | |
| New Evergreen Bondurant | 1992 | to 2297 | 36,862 | 3 | | New levee. |

## FIFTH LOUISIANA LEVEE DISTRICT.—Cont.

| NAME OF LEVEE | STATIONS | | Length in feet | Above high water of 1897—feet | Cubic yards required for 3 feet grade | REMARKS |
|---|---|---|---|---|---|---|
| **Tensas Parish—Cont.** | | | | | | |
| Bondurant | 2297 | to 2303 | 600 | 4 | | |
| New Claggett of 1900 | 2303 | to 2313 | 1,044 | 4 | | New levee. |
| Claggett | 2313 | to 2340 | 2,700 | 4 | | |
| New Claggett of 1898 | 2340 | to 2362 | 1,213 | 5 | | New levee. |
| Beaumont | 2362 | to 2392 | 3,000 | 3 | | |
| Bruin Bayou | 2392 | to 2405 | 1,300 | 3 | | |
| Panola | 2405 | to 2415 | 1,000 | 3 | | |
| | 2415 | to 2449 | 3,400 | 1 | 19,000 | |
| | 2449 | to 2483 | 3,400 | 3 | | |
| | 2483 | to 2505 | 2,200 | 3 | | |
| St Joseph | 2505 | to 2537 | 3,200 | 1 | 9,000 | |
| Duck Pond | 2537 | to 2617 | 8,000 | 1 | 58,000 | |
| Inge Field | 2617 | to 2771 | 2,982 | 2 | 75,000 | Continuous new levee |
| Cottage Home | | | 10,110 | | | |
| Minnehaha | | | 2,482 | | | |
| Harper's Chute | 2771 | to 2815 | 4,400 | 3 | | |
| China Grove | 2815 | to 2860 | 4,500 | 3 | | |
| Harper | 2860 | to 2920 | 6,000 | 3 | | |
| Kempe (upper) | 2920 | to 2945 | 2,500 | 0 | 50,000 | |
| New Kempe | 2950 | to 2989 | 4,595 | 1 | 75,000 | New levee, but sinking badly. |
| Kempe (lower) | 2989 | to 3114 | 12,500 | 0 | 250,000 | |
| Stockridge | 3114 | to 3192 | 5,200 | 3 | | Covered by U. S. contract, 2,600 ft. unfinished. |
| | | | 2,600 | 1 | | |
| Hedgeland | 3192 | to 3241 | 4,900 | 3 | | |
| Goldman | 3241 | to 3273 | 4,900 | 3 | | |
| Myrtle Grove | 3273 | to 3315 | 3,200 | 3 | | |
| Upper Waterproof | 3315 | to 3352 | 3,800 | 3 | | |
| Lower Waterproof | 3353 | to 3416 | 6,300 | 1 | 60,000 | |
| New L'Argent | 3416 | to 3526 | 8,314 | 5 | | |
| Aquasco | 3526 | to 3581 | 5,500 | 3 | | |
| **Concordia Parish.** | | | | | | |
| Bayou L'Argent | 3581 | to 3694 | 11,300 | 3 | | |
| Cane Brake | 3694 | to 3800 | 10,600 | 3 | | |
| Gibson Levee | 3800 | to 3938 | 13,800 | 2 | 80,000 | |
| | 3938 | to 3980 | 4,200 | 3 | 35,000 | |
| Rifle Point | 3980 | to 4022 | 4,200 | 0 | 35,000 | |
| | 4022 | to 4108 | 8,600 | 3 | | |
| Lake Concordia | 4108 | to 5046 | 93,800 | 1 | 535,000 | 12,000 feet at high water mark. |
| Palo Alto | 5046 | to 5132 | 8,600 | 2 | 21,000 | |
| Vidalia | 5132 | to 5223 | 9,100 | 1 | 45,000 | |
| Arnauldia to Moro | 5223 | to 5665 | 44,200 | 2 | 133,000 | |
| Moro | 5665 | to 5710 | 4,500 | 4 | | |
| Morville and Henderson | 5710 | to 5928 | 21,800 | 4 | | Under U. S. contract, 3,300 ft. unfinished. |
| Esperanza | 5928 | to 6002 | 7,400 | 4 | | Under U. S. contract. |
| Green to Deer Park | 6002 | to 6088 | 8,600 | 1 | 45,000 | |
| Forest Home&Fish Pond | 6088 | to 6267 | 17,900 | 2 | 75,000 | |
| New Ashley | 6267 | to 6383 | 13,346 | 3 | | New levee. |
| Glasscock | 6383 | to 0623 | 24,000 | 3 | | Covered by U. S. contract. |
| Roseland to Wildwood | 6623 | to 6808 | 18,300 | 2 | 55,000 | |

## RECAPITULATION.

Levees three feet above high water of 1897, or now being raised under United States contract.

| | | | |
|---|---|---|---|
| In U. S. Upper Tensas Dist. | | | |
| East Carroll parish | 111,517 ft. | | |
| Madison parish | 145,745 ft. | | |
| | | 257,262 ft. | |
| In U. S. Lower Tensas Dist. | | | |
| Madison parish | 52,882 ft. | | |
| Tensas parish | 248,138 ft. | | |
| Concordia parish | 105,746 ft. | | |
| | | 406,766 ft. | |
| Total above 3 feet, or under contract | | | 664,028 ft.=125.76 mls. |

Levees less than three feet above high water of 1897.

| | | | |
|---|---|---|---|
| In U. S. Upper Tensas Dist. | | | |
| East Carroll parish | 183,449 ft. | | |
| Madison parish | 22,060 ft. | | |
| | | 205,509 ft. | |
| In U. S. Lower Tensas Dist. | | | |
| Madison parish | | | |
| Tensas parish | 58,774 ft. | | |
| Concordia parish | 218,500 ft. | | |
| | | 277,274 ft. | |
| | | | 482,783 ft.= 91.44 mls. |
| Total length of line in Fifth Louisiana Levee District | | | 1,146,811 ft.=217.2 mls. |

List of points where new levees will probably be required in the Fifth Louisiana Levee District within the coming two years, showing name of locality, parish, and approximate estimate in cubic yards for construction of same, to a grade three feet above high water mark of 1897, with an 8-foot crown, slopes of 3 and 3 to 1, and a 20-foot banquette where required.

| NAME OF LOCALITY | PARISH | Estimated Yardage (cubic yds) | REMARKS |
|---|---|---|---|
| Longwood | E. Carroll | 125,000 | Placed under contract by State. |
| Illawara | E. Carroll | 1,400,000 | Absolutely necessary this year. |
| Cabinteele | Madison | 177,000 | Absolutely necessary this year. |
| Duckport | Madison | 83,000 | Absolutely necessary this year. |
| Young's Point | Madison | 140,000 | May be required this year. |
| Martin Loop | Madison | 340,000 | May be required this year. |
| Claggettt | Tensas | 120,000 | May be required this year. |
| Kempe | Tensas | 1,500,000 | May be required this year. |
| Sycamore | Concordia | 225,000 | May be required this year. |
| Vidalia | Concordia | 75,000 | Should be built this year. |
| Arnauldia | Concordia | 75,000 | May be required this year |
| Moro | Concordia | 72,000 | May be required this year. |
| Green's | Concordia | 200,000 | Absolutely necessary this year. |
| Upper Glasscock | Concordia | 200,000 | May be required this year. |
| Lower Glasscock | Concordia | 200,000 | May be required this year. |
| Fairview | Concordia | 30,000 | May be required this year. |
| Bougere | Concordia | 1,800,000 | Should be built, if possible. |
| Total | | 6,762,000 | |

## RECAPITULATION.

Approximate number of cubic yards of raising and enlargement required to place entire line three feet above high water of 1897, with 8-foot crown, and of slopes 3 and 3 to 1.

| | | |
|---|---|---|
| East Carroll parish | 704,000 cu. yds. | |
| Madison parish | 91,000 cu. yds. | |
| Total U. S. Upper Tensas Dist. | | 795,000 cu. yds. |
| Madison parish | | |
| Tensas parish | 623,000 cu. yds. | |
| Concordia parish | 1,059,000 cu. yds. | |
| Total U. S. Lower Tensas Dist. | | 1,682,000 cu. yds. |
| Total for Fifth Louisiana Levee Dist. | | 2,477,000 cu. yds. |

Approximate cubic yards required for construction of new levees during the next two years, estimated on grade three feet above high water of 1897.

| | | |
|---|---|---|
| East Carroll parish | 1,525,000 cu. yds. | |
| Madison parish | 740,000 cu. yds. | |
| Total U. S. Upper Tensas Dist. | | 2,265,000 cu. yds. |
| Madison parish | | |
| Tensas parish | 1,620,000 cu. yds. | |
| Concordia parish | 2,877,000 cu. yds. | |
| Total U. S. Lower Tensas Dist. | | 4,497,000 cu. yds. |
| Total in Fifth Louisiana Levee District | | 6,762,000 cu. yds. |
| Total required for raising and enlargement | | 2,477,000 cu yds. |
| Total required for new levees | | 6,762,000 cu. yds. |
| | | 9 239,000 cu. yds. |

## STATEMENT.

Showing approximate elevations of Levees on the Mississippi River above high water of 1897 in the Atchafalaya Basin Levee District; also approximate quantity of earthwork required to place said levee line to a grade 4.4 feet above the high water of 1897 at Red River Landing and 4.2 feet at Donaldsonville, with 8 feet crown and side slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades prepared by the U. S. Engineer's Office, Major Geo. McC. Derby, U. S. A. in charge, entitled, "Mississippi River Commission Grade, approved June 18, 1898."

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| Pointe Coupee Parish: | | | | | |
| Barbre's Ldg to Waverley | 0 to 59 | 5,900 | 3.0 | 15,000 | |
| Waverley | 59 to 130 | 7,100 | 3.0 | 20,000 | |
| Waverley to Tanglewood | 130 to 200 | 7,000 | 3.0 | 18,000 | |
| Tanglewood to Ferguson | 200 to 330 | 13,000 | 3.0 | 40,000 | |
| Torras | 330 to 369 | 3,900 | 3.0 | 13,000 | |
| Red River Landing | 369 to 445 | 7,600 | 2.5 | 65,000 | |
| Smithland | 445 to 458 | 1,300 | 4.9 | 5,000 | |
| Smithland to Williamsport | 458 to 630 | 17,200 | 3.5 | 45,000 | |
| Willamsport | 630 to 670 | 4,000 | 3.0 | 10,000 | |
| Villa Vista | 670 to 830 | 16,000 | 4.0 | ..... | |
| Lakeside | 830 to 880 | 5,000 | 3.5 | 10,000 | |
| Normandy | 880 to 975 | 9,500 | 3.5 | 30,000 | |
| Longwood | 975 to 1100 | 12,500 | 2.5 | 65,000 | |
| Ledoux | 1100 to 1170 | 7,000 | 1.5 | 50,000 | |
| Foster | 1170 to 1250 | 8,000 | 3.0 | 60,000 | |
| Catholic Church | 1250 to 1290 | 4,000 | 3.0 | 25,000 | |
| Fleta | 1290 to 1319 | 2,900 | 5.0 | ..... | |
| New Texas | 1319 to 1339 | 2,000 | 4.2 | ..... | |
| Poche to Morganza | 1339 to 1507 | 16,800 | 3.0 | 130,000 | |
| Morganza | 1507 to 1597 | 9,000 | 3.5 | 50,000 | |
| Grand and McCullum | 1597 to 1746 | 14,900 | 4.2 | ..... | |
| Morrison | 1746 to 1809 | 6,200 | 5.0 | ..... | |
| Watson | 1809 to 1820 | 1,100 | 4.2 | ..... | |
| Blue Store | 1820 to 1834 | 1,400 | 5.0 | ..... | |
| Buquoi | 1834 to 1848 | 1,400 | 4.2 | ..... | |
| St Maurice | 1848 to 1877 | 2,900 | 5.0 | ..... | |
| Fannie Richie | 1877 to 1908 | 3,100 | 2.5 | 25,000 | |
| Claiborne | 1908 to 1935 | 2,700 | 5.0 | ..... | |
| Red Store | 1935 to 1966 | 3,100 | 2.5 | 20,000 | |
| Scott | 1966 to 2052 | 8,600 | 3.0 | 75,000 | |
| Provosty and St. Francisville | 2052 to 2114 | 6,200 | 5.0 | ..... | |
| Lakeland | 2114 to 2207 | 9,300 | 3.0 | 70,000 | |
| Preston | 2207 to 2265 | 5,800 | 3.0 | 35,000 | |
| Woodburn-Alaska | 2265 to 2416 | 15,100 | 3.5 | 50,000 | |
| Waterloo | 2416 to 2438 | 2,200 | 5.0 | ..... | |
| St. Claude | 2438 to 2477 | 3,900 | 2.5 | 35,000 | |
| Nina | 2477 to 2560 | 8,300 | 5.0 | ..... | |
| Grand Bay | 2560 to 2604 | 4,400 | 2.0 | 45,000 | |
| Hermitage | 2604 to 2631 | 2,700 | 4.0 | ..... | |
| Total | ..... | ..... | .... | 1,006,000 | |

## ATCHAFALAYA BASIN LEVEE DISTRICT—Continued.

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **West Baton Rouge Parish:** | | | | | |
| Hermitage | 2631 to 2643 | 1,200 | 4.0 | ..... | |
| Point Manoir | 2643 to 2721 | 7,800 | 2.0 | 65,000 | |
| Arbroth | 2721 to 2949 | 22,800 | 2.0 | 190,000 | |
| Highland | 2949 to 2992 | 4,300 | 4.0 | ..... | |
| Rosehill | 2992 to 3032 | 4.000 | 3.0 | 18,000 | |
| Solitude | 3032 to 3151 | 11,900 | 2.0 | 150,000 | |
| Smithfield | 3151 to 3275 | 12,400 | 3.5 | 95,000 | |
| Orange Grove | 3275 to 3294 | 1,900 | 2.5 | 14,000 | |
| Cypress Hall | 3294 to 3344 | 5,000 | 1.0 | 60,000 | |
| Barroza | 3344 to 3422 | 7,800 | 4.4 | ..... | |
| Allendale | 3422 to 3452 | 3,000 | 3.0 | 15,000 | |
| Catherine to Belle Vale | 3452 to 3500 | 4,800 | 2.0 | 30,000 | |
| Belle Vale-Belmont | 3500 to 3540 | 4,000 | 3.0 | 15,000 | |
| Belmont-Viola | 3540 to 3579 | 3,900 | 2.5 | 25,000 | |
| Viola | 3579 to 3602 | 2,300 | 2.0 | 12,000 | |
| Viola to Belair | 3602 to 3675 | 7,300 | 4 0 | ..... | |
| Belair to Homestead | 3675 to 3828 | 15,300 | 3.0 | 60,000 | |
| Homestead to St. Michael | 3828 to 3881 | 5,300 | 4.5 | ..... | |
| St. Michael | 3881 to 3902 | 2,100 | 3.0 | 6,000 | |
| Oaks | 3902 to 3912 | 1,000 | 0.5 | 13,500 | |
| Limerick | 3912 to 3971 | 5,900 | 4 4 | ..... | |
| Beaulieux | 3971 to 4002 | 3,100 | 1.5 | 37,000 | |
| Beaulieux to Marioneaux | 4002 to 4261 | 25,900 | 4.6 | ..... | |
| Marioneaux-St. Delphine | 4261 to 4292 | 3,100 | 2.7 | 25,000 | |
| St Delphine | 4292 to 4320 | 2,800 | 4.6 | ..... | |
| Chenango | 4320 to 4360 | 4,000 | 3.3 | 30,000 | |
| Hickey | 4360 to 4401 | 4,100 | 3.3 | 35,000 | |
| Sardine Point | 4401 to 4598 | 19,700 | 3.0 | 120,000 | |
| Australia | 4598 to 4636 | 3 800 | 4.7 | ..... | |
| Australia | 4636 to 4659 | 2,300 | 3.0 | 12,000 | |
| Total | ..... | ..... | .... | 1,027,500 | |
| **Iberville Parish:** | | | | | |
| Australia to Medora | 4659 to 4759 | 10,000 | 3.5 | 35,000 | |
| Medora | 4759 to 4876 | 11,700 | 2.0 | 88,000 | |
| Medora to Turnerville | 4876 to 5010 | 13,400 | 3.0 | 80,000 | |
| Plaquemine Dyke | 5010 to 5017 | 700 | 3.0 | 7,000 | |
| Plaquemine and Fortville | 5017 to 5084 | 6,700 | 3.0 | 27,000 | |
| Fortville to Evergreen | 5084 to 5159 | 7,500 | 3.0 | 45,000 | |
| Evergreen | 5159 to 5205 | 4,600 | 3 0 | 30,000 | |
| Evergreen to Ella | 5205 to 5312 | 10,700 | 3.0 | 40,000 | |
| Ella | 5312 to 5329 | 1,700 | 3.0 | 10,000 | |
| Golden Ridge | 5329 to 5430 | 10,100 | 3.0 | 35,000 | |
| Golden Ridge to Palo Alto | 5430 to 5560 | 13,000 | 3.0 | 71,000 | |
| Dunboyne and Rice | 5560 to 5666 | 10,600 | 3.0 | 42,000 | |
| Bayou Goula | 5666 to 5707 | 4,100 | 1.0 | 41,000 | |
| Tally Ho-Owens | 5707 to 5747 | 4,700 | 3.0 | 20,000 | |
| Magnolia to White Castle | 5747 to 5870 | 12,300 | 3.0 | 40,000 | |
| White Castle to Celeste | 5870 to 6010 | 14,000 | 3.0 | 50,000 | |
| Celeste to Chatham | 6010 to 6119 | 10,900 | 3.5 | 35,000 | |
| Chatham | 6119 to 6150 | 3,100 | 4.0 | 6,000 | |
| Total | ..... | ... ... | .... | 702,000 | |

## ATCHAFALAYA BASIN LEVEE DISTRICT—Continued.

| NAME OF LEVEE | Station to Station | Length in feeet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| Ascension Parish: | | | | | |
| Chatham | 6150 to 6202 | 5,200 | 4.0 | ..... | |
| Chatham to Elise | 6202 to 6270 | 6,800 | 3.0 | 25,000 | |
| Woodstock | 6270 to 6312 | 4,200 | 3.0 | 20,000 | |
| Woodstock to Babin | 6312 to 6380 | 6,800 | 3.0 | 25,000 | |
| Babin to Pelico | 6380 to 6450 | 7,000 | 3 0 | 25,000 | |
| Pelico | 6450 to 6481 | 3,100 | 4.3 | ..... | |
| Pelico to McManor | 6481 to 6550 | 6,900 | 3 0 | 25,000 | |
| McManor to Souvenir | 6550 to 6625 | 7,500 | 3.0 | 30,000 | |
| Souvenir to Smoke Bend | 6625 to 6685 | 6,000 | 3.0 | 25,000 | |
| Smoke Bend to Fort Barrow | 6685 to 6766 | 8,100 | 3.0 | 25,000 | |
| Total | ..... | ..... | .. | 200,000 | |

**Approximate cubic yards required for construction of New Levees, during the next two years, on the Mississippi River to the above described grade.**

| NAME OF LOCALITY. | PARISH | Estimated cubic yards | REMARKS |
|---|---|---|---|
| Barbre | Pointe Coupee | 20,000 | |
| Torras | Pointe Coupee | 235,000 | |
| Fordoche | Pointe Coupee | 520,000 | |
| Lower Grand | Pointe Coupee | 213,000 | |
| Solitude | West Baton Rouge | 402.000 | |
| Limerick | West Baton Rouge | 90,000 | |
| Hickey | Iberville | 262,000 | |
| Eliza | Iberville | 165,000 | |
| Bayou Goula | Iberville | 212,000 | |
| Cora | Iberville | 133,000 | |
| Total | ..... | 2,252,000 | |

### RECAPITULATION.

**By parishes, of cubic yards required to place levee line on the Mississippi River to above described grade.**

| PARISH | Cubic yards of raising and enlarging required | Cubic yards of new levee required | |
|---|---|---|---|
| Pointe Coupee | 1,006,000 | 988,000 | |
| West Baton Rouge | 1,027,500 | 492,000 | |
| Iberville | 702,000 | 772,000 | |
| Ascension | 200,000 | ..... | |
| Totals | 2,935,500 | 2,252,000 | |
| Grand Total | ..... | ..... | 5,187,500 |

## STATEMENT.

Showing approximate elevation of levees on the Mississippi River, above high water of 1897, in the Lafourche Basin Levee District, also approximate quantity of earthwork required to place said levee line to a grade 4.2 feet above high water of 1897, at Donaldsonville, and 3 feet at Riceland, with crown, 8 feet slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades, prepared by the U. S. Engineer's Office, Major Geo. McC Derby, U. S. A., in charge; entitled "Mississippi River Commission Grade, approved June 18, 1898."

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—Feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **Ascension Parish:** | | | | | |
| Donaldsonville to Peytavin.. | 0 to 70 | 7,000 | 2.5 | 10,000 | |
| Peytavin to Cofield..... | 70 to 164 | 9,400 | 2.5 | 66,000 | |
| Cofield (new levee)..... | 164 to 244 | 6,000 | 2.5 | 21,000 | |
| Point Houmas to Parish Line | 244 to 394 | 15,000 | 2.0 | 90,000 | |
| Totals ..... | ..... | 37,400 | .... | 187,000 | |
| **St. James Parish:** | | | | | |
| Parish Line to Winchester.. | 394 to 534 | 14,000 | 2.0 | 84,000 | |
| Winchester to Jamestown... | 534 to 674 | 14,000 | 2.5 | 77,000 | |
| Jamestown..... | 674 to 695 | 2,100 | 4.0 | ..... | |
| Jamestown to Bonsecour.... | 695 to 920 | 22,500 | 2.0 | 125,000 | |
| Bonsecour..... | 920 to 966 | 4,600 | 2.5 | 18,000 | |
| Bonsecour to Pike's P'k, N. L | 966 to 1040 | 7,400 | 2.0 | 45,000 | |
| Pike's Peak (new levee).... | 1040 to 1081 | 4,100 | 3.5 | ..... | |
| Home Place..... | 1081 to 1114 | 3,300 | 2.0 | 20,000 | |
| Delogney..... | 1114 to 1163 | 4,900 | 3.8 | ..... | Under contract by U. S. Gov. |
| Oak Alley..... | 1163 to 1219 | 5,600 | 3.8 | ..... | |
| Valcour Aime..... | 1219 to 1351 | 13,200 | 2.5 | 66,000 | |
| Armant to Parish Line..... | 1351 to 1529 | 17,800 | 2.5 | 70,000 | |
| Totals ..... | ..... | 113,500 | ... | 505,000 | |
| **St. John Parish:** | | | | | |
| Parish Line to Willow Grove | 1529 to 1620 | 9,100 | 2.5 | 23,000 | |
| Willow Grove ..... | 1620 to 1650 | 3,000 | 3.7 | ..... | Under contract by U. S. Gov. |
| Whitney to Carroll..... | 1650 to 1739 | 8,900 | 3.0 | 32,000 | |
| Carroll..... | 1739 to 1786 | 4,700 | 2.0 | 21,000 | |
| Stevenson ..... | 1786 to 1865 | 7,900 | 3.3 | ..... | |
| White Rose..... | 1865 to 1881 | 1,600 | 3.0 | ..... | |
| Alliance..... | 1881 to 1936 | 5,500 | 3.5 | ..... | Under contract by U. S. Gov. |
| Columbia..... | 1936 to 2064 | 12,800 | 2.0 | 55,000 | |
| Tigerville to Glendale..... | 2064 to 2280 | 21,600 | 3.4 | ..... | |
| Glendale..... | 2280 to 2312 | 3,200 | 2.0 | 10,000 | |
| Totals ..... | ..... | 78,300 | .... | 141,000 | |

## LAFOURCHE BASIN LEVEE DISTRICT.—Cont'd.

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—Feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **St. Charles Parish:** | | | | | |
| Hymelia | 2312 to 2337 | 2,500 | 2.5 | 9,000 | |
| Hymelia | 2337 to 2356 | 1,900 | 3.6 | | |
| Hymelia to Killona | 2356 to 2471 | 11,500 | 3.6 | | |
| Killona to Pelican | 2471 to 2630 | 15,900 | 3.0 | 30,000 | |
| Pelican to Flagtown | 2630 to 2760 | 13.000 | 3.5 | | |
| Flagtown to Ashton | 2760 to 2898 | 13,800 | 3.0 | 55,000 | |
| Ashton | 2898 to 2919 | 2,100 | 3.5 | | Under contract by U. S. Gov. |
| Ashton | 2919 to 2948 | 2,900 | 3.2 | | |
| Ellington | 2948 to 2978 | 3,000 | 3.4 | | |
| Lone Star | 2978 to 3011 | 3,300 | 3.4 | | |
| Lone Star | 3011 to 3032 | 2,100 | 3.4 | | |
| Davis | 3032 to 3098 | 6,600 | 2.5 | 27,000 | |
| Louisa | 3098 to 3152 | 5,400 | 3.3 | | |
| Coopersville | 3152 to 3168 | 1,000 | 2.5 | 25,000 | Probable new levee. |
| Coopersville | 3168 to 3193 | 2,500 | 2.5 | 10,000 | |
| Coopersville | 3193 to 3211 | 900 | 2.5 | 23,000 | Probable new levee. |
| Alice | 3211 to 3274 | 6,300 | 3.3 | 42,000 | |
| Totals | | 94,700 | | 221,000 | |
| **Jefferson Parish:** | | | | | |
| Orange Grove | 3274 to 3288 | 1,500 | 2.0 | 25,000 | Probable new levee. |
| Orange Grove | 3288 to 3316 | 2,800 | 2.0 | 10,000 | |
| Soniat | 3316 to 3389 | 7,300 | 2.0 | 52,000 | |
| Odier | 3389 to 3462 | 7,300 | 1.0 | 52,000 | |
| Willswood | 3462 to 3525 | 6,300 | 2.5 | 20,000 | |
| Willswood | 3525 to 3574 | 4,900 | 1.0 | 38,000 | |
| Waggaman | 3574 to 3607 | 3,300 | 3.2 | | |
| Avondale | 3607 to 3635 | 2,800 | 2.5 | 6,000 | |
| Star Light | 3635 to 3657 | 2,200 | 1.0 | 25,000 | |
| Fairfield | 3657 to 3737 | 8.000 | 3.2 | | |
| Fairfield (new levee) | 3737 to 3785 | 4,900 | 2.5 | 20,000 | |
| LeBreton | 3785 to 3841 | 5,600 | 2.0 | 30,000 | |
| LeBreton to Company Canal | 3841 to 3953 | 11,200 | 3.2 | | |
| Company Canal to Bell | 0 to 183 | 18,300 | 3.2 | | Beginning of the U. S. Barataria Dist. |
| Bell | 183 to 213 | 3,000 | 2.5 | 14,000 | |
| Bell to Parish Line | 213 to 380 | 16,700 | 3.2 | | |
| Totals | | 106,100 | | 202,000 | |
| **Plaquemines Parish:** | | | | | |
| Upper Magnolia | 1107 to 1154 | 4,700 | 3.2 | | |
| Magnolia | 1154 to 1178 | 2 400 | 1.5 | 7,500 | |
| Little Rock | 1178 to 1196 | 1,800 | 3.2 | | |
| Fort St Leon | 1196 to 1254 | 5,800 | 1.5 | 20,000 | |
| Belle Chasse | 1254 to 1300 | 4,600 | 3.2 | | |
| Belle Chasse | 1300 to 1360 | 6,000 | 1.5 | 25,000 | |
| Belle Chasse to St. Ann | 1360 to 1428 | 6,800 | 2.0 | 18,000 | |
| St. Ann | 1428 to 1456 | 2,800 | 3.2 | | |
| Concession | 1456 to 1506 | 5,000 | 2.5 | 7,500 | |
| Concession | 1506 to 1525 | 1,900 | 3.2 | | |

## LAFOURCHE BASIN LEVEE DISTRICT,—Cont'd.

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—Feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| Plaquemines Parish—Cont. | | | | | |
| Concord | 1525 to 1620 | 9 500 | 2.0 | 23,000 | |
| Oak Point to Live Oak | 1620 to 1740 | 12,000 | 2.5 | 18,000 | |
| Live Oak | 1740 to 1776 | 3,600 | 2.0 | 11,000 | |
| Live Oak | 1776 to 1798 | 2,500 | 1.5 | 42,000 | Probable new levee. |
| Jesuits Bend | 1798 to 1836 | 3,800 | 1.5 | 10,000 | |
| Dobard | 1836 to 1848 | 1,200 | 3.3 | ..... | |
| Dobard to Star | 1848 to 1917 | 6,900 | 2.0 | 20,000 | |
| Star | 1917 to 1941 | 2,400 | 2.5 | 4,000 | |
| Star | 1941 to 1961 | 2,000 | 2.0 | 6,000 | |
| Star | 1961 to 1985 | 2,400 | 3.1 | ..... | |
| Tacoma to Alliance | 1985 to 2112 | 12,700 | 2.0 | 32,000 | |
| Alliance | 2112 to 2134 | 2,200 | 3.1 | ..... | |
| Alliance | 2134 to 2164 | 3,000 | 1.5 | 40,000 | Probable new levee. |
| St. Rosalie | 2164 to 2239 | 7,500 | 3.0 | ..... | |
| Ironton | 2239 to 2259 | 2,000 | 1.5 | 8,000 | |
| Myrtle Grove | 2259 to 2384 | 12,500 | 2.0 | 40,000 | |
| Wood Park | 2384 to 2394 | 1,000 | 3.0 | ..... | |
| Oakland | 2394 to 2420 | 2,600 | 2.0 | 8,000 | |
| Oakland to Deer Range | 2420 to 2517 | 9,700 | 1.5 | 30.000 | |
| Deer Range | 2517 to 2533 | 1,600 | 3.0 | ..... | |
| Deer Range to Diamond | 2533 to 2829 | 28,700 | 2.0 | 90,000 | |
| Diamond to W. Pt.-a-la-hache | 2829 to 2843 | 2,300 | 3.0 | ..... | |
| West Pointe a-la-hache | 2843 to 2868 | 2,500 | 2.5 | 8,000 | |
| Lower Magnolia | 2868 to 2891 | 2,300 | 1.0 | 30,000 | Probable new levee. |
| Lower Magnolia | 2891 to 2916 | 2,500 | 2.0 | 5,000 | |
| Lw. Magnolia to Barthelmy | 2916 to 3008 | 9,200 | 3.0 | ..... | |
| Barthelmy to Riceland | 3008 to 3072 | 6,400 | 2.0 | 20,000 | |
| Riceland | 3072 to 3081 | 900 | 3.0 | .... | |
| Riceland | 3081 to 3110 | 2,900 | 1.5 | 12,000 | |
| Totals | ..... | 201,600 | .. | 535,000 | |

## RECAPITULATION.

**By parishes, of cubic yards required to place levee line on the Mississippi River to above described grade.**

| PARISH | Cubic yards of raising and enlarging required | Cubic yards of new levee required. | |
|---|---|---|---|
| Ascension | 187,000 | ..... | |
| St. James | 505,000 | ..... | |
| St. John | 141,000 | ..... | |
| St. Charles | 173,000 | 48,000 | |
| Jefferson | 267,000 | 25,000 | |
| Plaquemines | 423,000 | 112,000 | |
| Totals | 1,696,000 | 185,000 | |
| Grand Total | ..... | ..... | 1,881,000 |

## STATEMENT.

Showing approximate elevations of levees above high water of 1897 in the Buras Levee District; also approximate quantity of earthwork required to place said levee line to a grade 3 feet above the high water of 1897 at Riceland plantation and 2.5 feet at the Jump; with 8 feet crown and side slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades, prepared by the U. S. Engineer's Office, Maj. Geo. McC. Derby, U. S A., in charge. entitled: "Mississippi River Commission Grade, approved June 18, 1898."

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS. |
|---|---|---|---|---|---|
| Plaquemines Parish—(right bank): | | | | | |
| Point Michael to Hayes | 3110 to 3230 | 12,000 | 2.0 | 22,000 | |
| Hayes to Treadaway | 3230 to 3309 | 7,900 | 1.5 | 20,000 | |
| Treadaway | 3309 to 3429 | 12,000 | 3.0 | ..... | |
| Giordana | 3429 to 3435 | 600 | 1.0 | 8,000 | Probable new le vee. |
| Guyot Settlement | 3435 to 3544 | 10,900 | 3.0 | ..... | |
| Orange Farm | 3544 to 3561 | 1,700 | 1.0 | 7,000 | |
| Orange Farm to Vaccaro | 3561 to 3735 | 17,400 | 3.0 | ..... | |
| Vaccaro | 3735 to 3766 | 3,100 | 1.0 | 9,000 | |
| Vaccaro to Metcalf | 3766 to 3840 | 7,400 | 1.0 | 20,000 | |
| Metcalf to McDonough | 3840 to 3922 | 8,200 | 3 0 | ..... | |
| McDonough | 3922 to 3939 | 1,700 | 1.0 | 5,500 | |
| McDonough to Fasterling | 3939 to 4035 | 9,600 | 1.5 | 25,000 | |
| Fasterling | 4035 to 4054 | 1,900 | 3.0 | ..... | |
| Fasterling to Pelas | 4054 to 4071 | 1,700 | 1.5 | 5,000 | |
| Pelas to Christians | 4071 to 4088 | 1,700 | 2.0 | 4,000 | |
| Buras Church | 4088 to 4100 | 1,200 | 1.5 | 13,000 | Probable new levee. |
| Pelican Store | 4100 to 4130 | 3,0 0 | 1.0 | 8.000 | |
| Rodney | 4130 to 4207 | 7,700 | 3.0 | ..... | |
| Chalona | 4207 to 4224 | 1,700 | 2.0 | 4,000 | |
| Cognovich | 4224 to 4238 | 1,400 | 1.0 | 6,000 | |
| Mrs. Smith | 4238 to 4251 | 1,500 | 1.0 | 12,600 | Probable new levee. |
| Leovy (upper) | 4251 to 4267 | 1,600 | 1.5 | 3,500 | |
| Shoenberger | 4267 to 4292 | 2,500 | 1.0 | 5,000 | |
| Reddick | 4292 to 4306 | 1,400 | 3.0 | ..... | |
| White | 4306 to 4320 | 1,400 | 0.0 | 7,000 | |
| Booth | 4320 to 4445 | 12,500 | 3.0 | ..... | |
| McCaleb to Dr. Booth | 4445 to 4577 | 13,200 | 1.0 | 40,000 | |
| Dr. Booth | 4577 to 4622 | 4,500 | 3,0 | ..... | |
| Dr. Booth to Gauthier | 4622 to 4649 | 2,700 | 1.0 | 7,000 | |
| Gauthier to Noel Buras | 4649 to 4684 | 3,500 | 3.0 | ..... | |
| Cyprien Buras | 4684 to 4724 | 4,000 | 1.5 | 8,000 | |
| Cyprien Buras to Andre Buras | 4724 to 4823 | 9,900 | 1.5 | 25,000 | |
| Andre Buras to Leovy | 4823 to 4866 | 4,300 | 0.5 | 13,000 | |
| Leovy | 4866 to 4896 | 3,000 | 3.0 | ..... | |
| Total | ..... | ..... | .... | 277,000 | |

### RECAPITULATION.

| | |
|---|---|
| Cubic yards of raising and enlarging required | 244,000 |
| Cubic yards of new levee required | 33,000 |
| Total | 277,000 |

## STATEMENT.

Showing approximate elevations of levees above high water of 1897 on the Pontchartrain Levee District; also approximate quantity of earthwork required to place said levee line to a grade 4.6 feet above high water of 1897 at Baton Rouge and 3.3 feet at parish line of Jefferson and Orleans with crown 8 feet and slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades, prepared by the U. S. Engineer's Office, Maj. Geo. McC. Derby, U. S. A., in charge, entitled: "Mississippi River Commission, approved June 18, 1898."

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **East Baton Rouge Parish:** | | | | | |
| Baton Rouge to Burtville | 0 to 691 | 69,100 | 4.2 | ..... | |
| Burtville | 691 to 737 | 4,600 | 4.6 | ..... | |
| Totals | ..... | ..... | .... | ..... | |
| **Iberville Parish:** | | | | | |
| Woodstock | 737 to 768 | 3,100 | 4.4 | ..... | |
| Manchac | 768 to 810 | 4,200 | 4.4 | ..... | |
| Granada | 810 to 854 | 4,400 | 4.4 | ..... | |
| Hermitage | 854 to 905 | 5,100 | 4.4 | ..... | |
| Towles | 905 to 943 | 3,800 | 4.4 | ..... | |
| Towles to Billings | 943 to 976 | 3,300 | 2.0 | 27,000 | |
| Billings to Gomez | 976 to 1074 | 9,800 | 4.3 | ..... | |
| Gomez | 1074 to 1106 | 3,200 | 3.0 | 15,000 | |
| Gomez | 1106 to 1122 | 1,600 | 4.3 | ..... | |
| Landry | 1122 to 1181 | 5,900 | 4.3 | ..... | |
| Mount Olive | 1181 to 1213 | 3,200 | 4.3 | ..... | |
| Forlorn Hope | 1213 to 1277 | 6,400 | 4.3 | ..... | |
| Jolisaint | 1277 to 1305 | 2,800 | 2.0 | 17,000 | |
| Golden Gate | 1305 to 1364 | 5,900 | 4.2 | ..... | |
| Willow Glen | 1364 to 1448 | 8,400 | 3.5 | 28,000 | |
| Oakley to Margaret | 1448 to 1507 | 5,900 | 2.0 | 45,000 | |
| Margaret | 1507 to 1521 | 1,400 | 3.0 | 12,000 | |
| Bagatelle | 1521 to 1581 | 6,000 | 2.0 | 37,000 | |
| Edna | 1581 to 1624 | 4,300 | 1.5 | 36,000 | |
| Thiery | 1624 to 1635 | 1,100 | 4.0 | ..... | |
| Ophelia | 1635 to 1738 | 10,300 | 1.5 | 80,000 | |
| Lorio | 1738 to 1748 | 1,000 | 4.0 | ..... | |
| Welcome | 1748 to 1763 | 1,500 | 1 5 | 12,000 | |
| Point Clear | 1763 to 1797 | 3,400 | 4.0 | ..... | |
| Point Clear | 1797 to 1877 | 8,000 | 1.0 | 64,000 | |
| Leper Home | 1877 to 1934 | 5,700 | 4.0 | ..... | |
| Indian Camp | 1934 to 1985 | 5,100 | 4.0 | ..... | |
| Hard Times | 1985 to 2043 | 5,800 | 4.0 | ..... | |
| Arizona to Parish Line | 2043 to 2147 | 10,400 | 2.0 | 85,000 | |
| Totals | ..... | 141,000 | .... | 458,000 | |
| **Ascension Parish:** | | | | | |
| Southwood | 2147 to 2280 | 13,300 | 2.0 | 100,000 | |
| Mt. Houmas-Belle Helene | 2280 to 2385 | 10,500 | 0.5 | 115,000 | |
| Bowden | 2385 to 2460 | 7,500 | 1.0 | 53,000 | |
| Landry | 2460 to 2498 | 3,300 | 2.0 | 20,000 | |

## PONTCHARTRAIN LEVEE DISTRICT—Continued.

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **Ascension Parish—Cont'd** | | | | | |
| Willow Grove | 2493 to 2510 | 1,700 | 3.5 | ..... | |
| Gem | 2510 to 2520 | 1,000 | 2.0 | 6,000 | |
| Dicharry | 2520 to 2617 | 9,700 | 2.0 | 60,000 | |
| Canti to LeBlanc | 2617 to 2685 | 6 800 | 1.0 | 50,000 | |
| LeBlanc to Darrowville | 2685 to 2757 | 7,200 | 2.0 | 50,000 | |
| Darrowville to Hermitage | 2757 to 2850 | 9,300 | 1.0 | 84,000 | |
| Hermitage to Bocage | 2850 to 2953 | 10,300 | 2 0 | 65,000 | |
| Riverton | 2953 to 3020 | 6,700 | 0.0 | 80,000 | |
| Burnside | 3020 to 3041 | 2,100 | 2.0 | 15,000 | |
| Houmas | 3041 to 3075 | 3,000 | 0.0 | 36,000 | |
| Houmas to Parish Line | 3075 to 3140 | 7,500 | 0.5 | 53,000 | |
| Totals | ..... | 99,900 | ... | 787,000 | |
| **St. James Parish:** | | | | | |
| Parish Line to Tippecanoe | 3140 to 3189 | 4,900 | 2.0 | 20,000 | |
| Tippecanoe | 3189 to 3238 | 4,900 | 2.0 | 20,000 | |
| St. Mary Chapel to Nita | 3238 to 3471 | 23,300 | 1.0 | 310,000 | |
| Nita | 3471 to 3523 | 5,200 | 2.5 | 30,000 | |
| Celestine | 3523 to 3542 | 1,900 | 1 5 | 75,000 | Probable new levee. |
| Lilley | 3542 to 3580 | 3,800 | 2 5 | 19,000 | |
| Uncle Sam to Belmont | 3580 to 3890 | 31,000 | 1.5 | 225,000 | |
| Belmont | 3890 to 3948 | 5,800 | 2.0 | 30,000 | |
| Belmont to St. Elmo | 3948 to 4044 | 9.600 | 1.5 | 125 000 | |
| St. Elmo | 4044 to 4110 | 6,600 | 2.0 | 35,000 | |
| Belle Vue to Parish Line | 4110 to 4858 | 24,800 | 1.5 | 150,000 | |
| Totals | ..... | 121,800 | .... | 1,039,000 | |
| **St. John Parish:** | | | | | |
| Parish Line to Angelina | 4358 to 4416 | 5,800 | 2.5 | 44,000 | |
| Angelina | 4416 to 4443 | 2,700 | 0.5 | 30,000 | |
| New Hope | 4443 to 4489 | 5,000 | 1.5 | 190,000 | Probable new levee. |
| Hope | 4489 to 4531 | 4,200 | 1.5 | 25,000 | |
| Hope to Terrehaute | 4531 to 4610 | 7,900 | 2.0 | 32,000 | |
| Terrehaute to Cornland | 4610 to 4740 | 13,000 | 1.0 | 65,000 | |
| Cornland | 4740 to 4766 | 2,600 | 2.0 | 13,000 | |
| Cornland to Belle Point | 4766 to 4841 | 7,500 | 1.5 | 35,000 | |
| Belle Point to Louque | 4841 to 5005 | 16,400 | 1.5 | 92,000 | |
| Louque | 5005 to 5027 | 2,000 | 2.0 | 70,000 | Probable new levee. |
| Bonnet Carre to Parish Line | 5027 to 5142 | 11,500 | 3.0 | 50,000 | |
| Totals | ..... | 78,600 | ... | 646,000 | |
| **St. Charles Parish:** | | | | | |
| Anchor | 5142 to 5205 | 6,300 | 1.5 | 40,000 | |
| Gypsy to Diamond | 5205 to 5363 | 15,800 | 2.0 | 482,000 | |
| Diamond | 5363 to 6396 | 3,500 | 2.0 | 90,000 | Probable new levee. |
| Diamond to Good Hope | 5396 to 5434 | 3,800 | 1.0 | 37,000 | |
| Prospect | 5434 to 5517 | 8,300 | 2.0 | 35,000 | |
| Sarpy | 5517 to 5545 | 2,800 | 1.5 | 30,000 | |

## PONTCHARTRAIN LEVEE DISTRICT—Continued.

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| St. Charles Parish—Cont'd. | | | | | |
| Victoria | 5545 to 5601 | 5,600 | 2.0 | 45,000 | |
| Red Church | 5601 to 5664 | 6,300 | 2.0 | 22,000 | |
| Destrehan | 5664 to 5734 | 7,000 | 1.5 | 32,000 | |
| Modoc-Elkinsville | 5734 to 5840 | 10,600 | 3.7 | .... | |
| St. Rose | 5840 to 5913 | 7,300 | 1.0 | 40,000 | |
| Amedia | 5913 to 5959 | 4,600 | 2.0 | 20,000 | |
| Upper Fairview | 5959 to 6002 | 4,300 | 3.7 | ..... | |
| Lower Fairview to P'sh Line | 6002 to 6024 | 2,200 | 2.0 | 13,000 | |
| Totals | ..... | 88,400 | .... | 886,000 | |
| Jefferson Parish: | | | | | |
| Parish Line to Hanson City | 6024 to 6062 | 3,800 | 1.5 | 15,000 | |
| Hanson City | 6062 to 6077 | 1,500 | 3.5 | ..... | |
| Hanson City to Trudeau | 6077 to 6186 | 10,900 | 1.5 | 50 000 | |
| Sauve | 6186 to 6237 | 5,100 | 3.5 | ..... | |
| Sauve to Boisblanc | 6237 to 6271 | 4,000 | 1.5 | 160,000 | Probable new levee. |
| Boisblanc | 6271 to 6291 | 2,000 | 1.5 | 12,000 | |
| Perkins | 6291 to 6321 | 3,100 | 2.0 | 60,000 | Probable new levee. |
| Tchoupitoulas | 6321 to 6384 | 6,300 | 1.5 | 30,000 | |
| Soniat, lower | 6384 to 6394 | 1,000 | 3.4 | ..... | |
| Southern University | 6394 to 6419 | 2,500 | 1.0 | 12,000 | |
| Lafreniere | 6419 to 6437 | 1,800 | 3.3 | .... | |
| Elmwood | 6437 to 6519 | 8,200 | 1.5 | 35,000 | |
| White Hall to Southport | 6519 to 6584 | 6,500 | 3.3 | ..... | |
| Southport | 6584 to 6608 | 2,400 | 1.0 | 15,000 | |
| Totals | ..... | 59,100 | .... | 389,000 | |

## RECAPITULATION.

**By parishes, of cubic yards required to place levee line to above described grade.**

| PARISH | Cubic yards of raising and enlarging required | Cubic yards of new levee required | |
|---|---|---|---|
| East Baton Rouge | ..... | ..... | |
| Iberville | 458,000 | ..... | |
| Ascension | 787.000 | ..... | |
| St. James | 964,000 | 75,000 | |
| St. John | 386 000 | 260 000 | |
| St. Charles | 796,000 | 90,000 | |
| Jefferson | 169,000 | 220,000 | |
| Totals | 3,560 000 | 645,000 | |
| Grand total | ..... | ..... | 4,205,000 |

## STATEMENT.

Showing approximate elevations of levees above high water of 1897, in the Lake Borgne Levee District; also approximate quantity of earthwork required to place said levee line to a grade 3.3 feet above the high water of 1897 at upper boundary of St. Bernard Parish, and 3 feet above high water of 1897 at Bohemia Plantation, upper line; with 8 feet crown, and slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades, prepared by the U. S. Engineers' Office, Major Geo. McC. Derby, U. S. A., in charge, entitled "Mississippi River Commission Grade, approved June 18, 1898."

| NAME OF LEVEE | Station to Station | Length in feet | Above high water of 1897—Feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| **St. Bernard Parish:** | | | | | |
| Parish Line | 0 to 12 | 1,200 | 3.0 | ... | |
| Slaughter House to Brou | 12 to 110 | 9,300 | 2.0 | 33,000 | |
| Chalmette | 110 to 164 | 5,400 | 3.0 | ..... | |
| Corinne | 164 to 321 | 15,700 | 3.0 | ..... | |
| Story to Poydras | 321 to 507 | 18,600 | 3.0 | ..... | |
| Poydras | 507 to 564 | 5,700 | 2.0 | 20,000 | |
| Totals | ..... | 55,900 | ... | 53,000 | |
| **Plaquemines Parish:** | | | | | |
| Parish Line to Scarsdale | 564 to 873 | 30,900 | 3.0 | ..... | |
| Scarsdale | 873 to 900 | 2,700 | 2.0 | 10,000 | |
| Scarsdale | 900 to 918 | 2,000 | 2.0 | 35,000 | Probable new levee. |
| Scarsdale to Stella | 918 to 950 | 3,200 | 3.0 | ..... | |
| Stella | 950 to 977 | 2,700 | 2.0 | 10,000 | |
| Stella to Mary | 977 to 1054 | 7,700 | 2.0 | 25,000 | |
| Mary | 1054 to 1067 | 1,300 | 3.0 | ..... | |
| Promised Land | 1067 to 1104 | 3,700 | 2.0 | 8,000 | |
| Promised Land to Bertrand ville | 1104 to 1169 | 6,500 | 3.0 | ..... | |
| Bertrandville to Belair | 1169 to 1384 | 21,500 | 2.0 | 65,000 | |
| Belair | 1384 to 1426 | 4,400 | 2.0 | 90,000 | Probable new levee. |
| Belair to Fairview | 1426 to 1458 | 3,200 | 3.0 | ..... | |
| Fairview | 1458 to 1468 | 1,200 | 2.0 | 25,000 | Probable new levee. |
| Fairview | 1468 to 1488 | 2,000 | 3.0 | ..... | |
| Fairview to Bonsejour | 1488 to 1551 | 6,300 | 3.0 | ..... | |
| Bonsejour to Poverty Point | 1551 to 1690 | 13,900 | 1.5 | 55,000 | |
| Poverty Point | 1690 to 1745 | 5,500 | 1.5 | 10,000 | |
| St. Sophie | 1745 to 1809 | 6,400 | 3.0 | ..... | |
| Harlem | 1809 to 1877 | 6,800 | 1.5 | 30,000 | |
| Harlem | 1877 to 1899 | 2,200 | 3.0 | ..... | |
| Harlem to Favrot Store | 1899 to 2078 | 17,900 | 2.5 | 86,000 | |
| Favrot Store to Court House | 2078 to 2286 | 20,800 | 2.5 | 52,000 | |
| Felix Hingle | 2286 to 2301 | 1,500 | 3.0 | ..... | |
| Hingle to Bohemia | 2301 to 2439 | 13,800 | 2.0 | 35,000 | |
| Bohemia | 2439 to 2483 | 4,400 | 2.5 | 4,500 | |
| Bohemia | 2483 to 2535 | 5,200 | 1.0 | 10,000 | |
| Totals | ..... | 197,700 | .... | 500,500 | |

## LAKE BORGNE LEVEE DISTRICT.—Continued.

### RECAPITULATION,

By parishes, of cubic yards required to place levee line to above described grade.

| PARISH | Cubic yards of raising and enlarging required. | Cubic yards new levee required. | |
|---|---|---|---|
| St. Bernard | 53,000 | ..... | |
| Plaquemines | 350 500 | 150,000 | |
| Totals | 403,500 | 150,000 | |
| Grand Total | ..... | ..... | 553,500 |

## STATEMENT.

Showing approximate elevations of levees above high water of 1897 in the Grand Prairie Levee District; also approximate quantity of earthwork required to place said levee line to a grade 3 feet above high water of 1897, with crown 8 feet and slopes 3 and 3 on 1.

NOTE.—The above grade is taken from a table of grades prepared by the U. S. Engineer's Office, Major Geo. McC. Derby, U. S. A., in charge, entitled: "Mississippi River Grade, approved June 18, 1898."

| NAME OF LEVEE | STATION TO STATION | Length in feet | Above high water of 1897—feet | Cubic yards required | REMARKS |
|---|---|---|---|---|---|
| Plaquemines Parish—(left bank): | | | | | |
| Bohemia to Boyle | 0 to 61 | 6,100 | 1.0 | 19,000 | |
| Boyle to Nestor Canal | 61 to 246 | 18,500 | 1.0 | 65,000 | |
| Nestor Canal to Edgerson | 246 to 290 | 4,400 | 0.5 | 18,000 | |
| Edgerson to Burton | 290 to 307 | 1,600 | 1.0 | 12,000 | Probable new levee. |
| Burton to Canton | 307 to 368 | 6,100 | 1.5 | 16,000 | |
| Canton to Struth | 368 to 433 | 6,500 | 0 5 | 27,000 | |
| Struth to Edgecombe | 433 to 477 | 4,400 | 1.5 | 11,000 | |
| Edgecombe to Matulich | 477 to 531+50 | 5,450 | 0.5 | 22,000 | |
| Matulich to Rapp | 531+50 to 584 | 5,250 | 2.5 | | |
| Rapp to Luccio | 584 to 699 | 11,500 | 1.5 | 30,000 | |
| Luccio to Nicholl's P. O | 699 to 801 | 10,200 | 0 5 | 41,000 | |
| Nicholl's P.O. to Geo. Johnson | 801 to 821 | 2,000 | 0.0 | 10,000 | |
| Geo. Johnson to Jacomini | 821 to 929 | 10,800 | 1.0 | 44,000 | |
| Jacomini to Quarantine | 929 to 1004 | 7,500 | 1.0 | 27,000 | |
| Quarantine | 1004 to 1010 | 600 | 2.5 | | |
| Henry Baker to Jos. Angello | 1010 to 1036 | 2,100 | 1.0 | 9,000 | |
| Angello to Polite's Canal | 1036 to 1055 | 1,900 | 1.0 | 6,000 | |
| Polite's Canal to Geo. Smith | 1055 to 1074 | 1,900 | 1.0 | 6,000 | |
| Geo. Smith to Geo Crumbie | 1074 to 1086 | 1,200 | 0 5 | 5,000 | |
| Geo Crumbie to Emile Buras | 1086 to 1161 | 7,500 | 1.0 | 27,000 | |
| Emile Buras to Fort St. Philip | 1161 to 1249 | 8,800 | 0.5 | 36,000 | |
| Totals | | 124,800 | | 431,000 | |

## RECAPITULATION.

| | |
|---|---|
| Cubic yards of raising and enlarging required | 419,000 |
| Cubic yards of new levee required | 12,000 |
| Total | 431,000 |

## RECAPITULATION,

By Levee Districts of the State of Louisiana, of cubic yards required to place entire levee line on the Mississippi River, to the above stated grades and dimensions (not including the Orleans Levee District).

| LEVEE DISTRICTS | Cubic yards of raising and enlarging required | Cubic yards of new levee required | Total cubic yards required | REMARKS |
|---|---|---|---|---|
| Fifth Louisiana (Mississippi River).... | 2,477,000 | 6,762,000 | 9,239,000 | 3/ grade. |
| Atchafalaya Basin (Mississippi River). | 2,935,500 | 2,252,000 | 5,187,500 | M. R. C. grade. |
| Lafourche Basin (Mississippi River)... | 1,696,000 | 185,000 | 1,881.000 | M. R. C. grade. |
| Buras (Mississippi River)..... ... ... | 244,000 | 33,000 | 277,000 | M. R. C. grade. |
| Pontchartrain (Mississippi River)..... | 3,560,000 | 645,000 | 4,205,000 | M. R. C. grade. |
| Lake Borgne Basin (Mississippi River) | 303,500 | 150 000 | 553,500 | M. R. C. grade. |
| Grand Prairie (Mississippi River)..... | 419,000 | 12,000 | 431,000 | M. R. C. grade. |
| Grand Totals..... ..... | 11,735,000 | 10,039,000 | 21,774,000 | |

## RECAPITULATION,

Of length of levee line on the Mississippi River, in the State of Louisiana, showing elevations of levees, in feet, above the high water of 1897 (not including the Orleans Levee District).

| LEVEE DISTRICTS | Less than one foot above high water of 1897 — Length in feet | Between one and two feet above high water of 1897— Length in feet | Betw'n two and three feet above high water of 1897— Length in feet | 3 feet or more above high water of 1897 —Length in feet | Totals in miles |
|---|---|---|---|---|---|
| Fifth Louisiana (Mississippi River).... | 31,200 | 179,255 | 276,223 | 660,133 | 217.19 |
| Atchafalaya Basin (Mississippi River). | 1,000 | 192,000 | 104,800 | 378,410 | 128.07 |
| Lafourche Basin (Mississippi River)... | 16,700 | 177,450 | 231,800 | 204,450 | 119.39 |
| Buras (Mississippi River)..... ..... | 44,100 | 49.000 | 84,700 | ... ..... | 33.69 |
| Pontchartrain (Mississippi River) .. . | 30,400 | 353,900 | 108 800 | 169,400 | 125.47 |
| Lake Borgne Basin (Mississippi River) | ..... | 56 000 | 93,200 | 104,400 | 48.03 |
| Grand Prairie (Mississippi River)..... | 38,500 | 80,400 | 5,900 | ..... | 28.65 |
| Totals in feet..... ..... ..... | 161,900 | 1,088,005 | 905,423 | 1,516,793 | .... ... |
| | or | or | or | or | |
| Totals in miles..... ..... .... | 30.66mls | 206.06 mls | 171.49 mls | 287.28 mls | 695.49m |

# APPENDIX D.

**Copies of Certain Reports and Letters of the Board of State Engineers to the Boards of Levee Commissioners.**

# APPENDIX D.

## SUNDRY REPORTS OF BOARD OF STATE ENGINEERS TO BOARDS OF LEVEE COMMISSIONERS.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., November 8, 1898.

*Hon. Jno. P. Parker, President, Tensas Basin Levee Board,*
*Monroe, La.:*

DEAR SIR — I am in receipt of yours of the 7th inst., enclosing letter from Mr. J. M. Whitehill, President of the Desha Levee Board, relative to extension of levee line down Arkansas River.

I think there can be no doubt that such an extension would aid in protecting the Tensas Basin Levee District from overflow, and believe that $5,000.00 applied to the work, if it insured an equal contribution from the other local levee organizations, would be a profitable expenditure.

Should you enter into an agreement with the other Levee Boards, as suggested in Mr. Whitehill's letter, it would probably be as well for your Board not to become responsible for any partial payments on the work beyond the proportion your subscription bears to the total amount subscribed. It would also be desirable to make use of the opportunity to obtain, if possible, some pledge from the Red Fork Levee Board that they will not oppose an extension of the levee line up Amos Bayou; for so long as the levees above Red Fork remain in their present insecure condition you will remain in danger of overflow from crevasses in the Arkansas River levees, no matter how far down that stream they are carried.

The Board of State Engineers will, of course, be ready to do any engineering work that may be needed, though in case an association of the Levee Boards preferred to have Mr. Shields, or any other reputable engineer attend to the matter, it should make no difference in our approval.

Very respectfully,

HENRY B. RICHARDSON,
*Chief State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., December 15, 1898.

*Hon. Jno. P. Parker, President, Tensas Basin Levee Board,*
*Monroe, La.:*

DEAR SIR—I am in receipt of yours of the 9th, asking my views "respecting the request of the Red Fork Levee Board," etc.

As I understand the original request of the Red Fork Board, was that you agree to contribute $5,000.00 towards a fund of $11,000.00, to be expended in building an extension of the Arkansas River levee, built by the United States, below its present terminus on Jefferson Lake, for a mile or a mile and a half; the Chicot Board to contribute $3,000.00; the Desha Board $1,000.00, and the Red Fork Board $2,000.00; as outlined in letter of November 4th, addressed to you by Mr. Whitehill.

I wrote you on November 8th relative to this proposition, stating my views and the approval of the Board of State Engineers.

From what was said by the representatives of your Board and the Desha and Red Fork Boards, before the Mississippi River Commission, at Greenville, as well as from your letter, it appears that this proposition has been enlarged so as to include an annual contribution of the amounts stated for five years, and Judge Pindall, in his remarks before the Commission proposed, as I understood him, that the contributions to be made by the several Levee Boards be expended upon the levees of the Arkansas River *above* Red Fork, leaving the United States to carry on the extension below Jefferson Lake. And you will remember, that Capt. Newcomer expressed his opinion that the enlargement of the existing levee between Red Fork and Lake Jefferson is as important as the extension.

Since my return here I have received a copy of a resolution passed by the Commission, indicating their purpose to strengthen the levee below Red Fork, and extend it below Lake Jefferson, as fast as appropriations and the exigencies of the case may make it possible, and presume a copy of the same resolution was sent to you.

It does not seem to me that the time has yet come (and I have doubts if it ever will come) when you can consider it good policy for your Board to join with the local Boards in building and maintaining the levees along the Arkansas River above Red Fork or rather above the upper end of the United States Levee near Red Fork. Of course, the maintenance of the levees above Red Fork should, in some degree, aid in the protection of the Tensas Basin District from overflow, which fact, under the law, is a sufficient warrant for you to expend your money on them. But it seems to me you are in comparatively little danger from the Arkansas River above Red Fork, so long as the mouth of Cypress Creek remains open for drainage, and I could not, with my present understanding of the situation, advise that you undertake making any general contributions for the maintenance of these levees.

It is not unlikely, however, that you may hereafter find it advantageous to assist in some specific work of importance, as you did several years ago in the case of the Auburn Break Levee; but it seems to me you may better wait till such emergencies present themselves. So, all things considered, it hardly appears to me that Judge Pindall's modification of the proposition should appeal to you with favor.

As regards the enlargement of the levee already built by the United States from near Red Fork to Jefferson Lake, I have no doubt of the correctness of Capt. Newcomer's statement that it is necessary; but I should hesitate to recommend that you apply your funds to that work *alone,* without also securing some extension of the line below Lake Jefferson, for the reason that no immediate results would be apparent from perfecting the existing line, while its extension would undoubtedly diminish the flow around the head of the Amos Bayou Levee, unless, in case of a flood, such as would breach or overtop the existing line.

To come, now, to what I understand is actually proposed, I must say that I hardly see why your Board should be called upon to pledge contributions for so long a time as five years, whatever it may be essential for the other Boards to do. You have always been in funds, and ready and willing to do whatever you have found would aid in the protection of your interests. But should you, for any reason, conclude it good policy to promise an annual contribution of $5,000.00, for five years, to be expended for the improvement of the levee already built by the United States along the Arkansas River from near Red Fork to Lake Jefferson, and for its extension southward towards Cypress Creek, the Board of State Engineers could not disapprove your action, as there can be no doubt that this line of levee would aid in protecting your district from overflow.

It seems to me, however, that you might, perhaps, do a better thing that should avoid all complications with other levee districts, while giving them for the present, more even, than they have asked for.

I take it that you can well afford to offer to (immediately, and irrespective of the other levee Boards) place in the hands of, or subject to the order of, the United States officer in charge of the district (at present Capt. Newcomer) $5,000.00, to be expended under his direction in the extension of the levee below Jefferson Lake, and $5,000.00 more, to be expended in same manner, at his discretion, either in the enlargement of the levee already built by the United States from near Red Fork to Lake Jefferson, or in extending the same southward. When this sum was expended you could see what the effect had been, and what the other levee Boards had done, and be prepared to continue your contributions if the results appeared to warrant it.

If you can do this, and inform the other Boards that you have done

so, it seems to me there should be no need at present for any further agreements or conventions between you and them; and that it would only remain for them to emulate your good example.

Very respectfully,

HENRY B. RICHARDSON,
*Chief State Engineer.*

---

MONROE, LA., July 12, 1899.

*To the Honorable President and Members of the Board of Commissioners of the Tensas Basin Levee District, Monroe, La.:*

GENTLEMEN—Having, within the current week, visited the line of levee in Arkansas from O'Possum Fork to Fulton Lake, in company with Mr. E. C. Tollinger, United States Assistant Engineer, Mr. T. S. Shields, Levee Inspector, and Mr. J. L. Borden, Secretary of your Board, I would respectfully beg leave to submit the following report for your information and consideration:

The condition of the line of public levee in Arkansas, upon the integrity of which your district is dependent for protection from overflow, may, at this time, be estimated as follows:

From the upper end of the line, above Costello's Gin to O'Possum Fork, the line stands generally three feet above the high water of 1897, with good crown and section. Some parts of this are overgrown with weeds and brush, but provision has been made by your Board and the General Government to clear them off and restore such losses of section from rain and wave-wash as may have occurred, and to replant the section with living roots of Bermuda grass, where necessary.

From O'Possum Fork to Lucca Landing, a contract with your Board for enlarging the line to a grade three feet above 1897 water, with an eight foot crown and three and three to one slopes, is in effect, and should be completed within the next ninety days. The contractor there was interrupted in his work by the high water of this year and has not yet resumed operations, but will, within the course of the next fifteen days, being at present engaged upon a government contract, immediately adjoining, in the completion of which you are as deeply interested as in that which you have under contract yourselves.

From this point down to Arkansas City, the line when treated by the Government and your Board, as at present contemplated, will stand not less than two to three feet above the high water of 1897, with good crown and slopes, except a stretch of three thousand six hundred feet between stations 484 and 520, along which it will not average over one and a half feet above 1897. This line of levee, however, possesses very generous proportions, with a width of crown ranging from ten to twelve feet, and can be readily topped to a safer grade at any time during the season should the emergency arise.

The work of the season on this part of the line, that is, from O'Possum Fork to Arkansas City, classed as contemplated for your Board

consists of the completion of the O'Possum Fork south enlargement, stations 340 to 420, under contract to J. E. Moore; and of the Arkansas City Loop Enlargement, stations 798 to 897, under contract to J. B. Lewis & Co.; a banquette back of O'Possum Fork Loop, stations 370+76 to 379+53; a new levee from stations 677 to 690; enlargement from stations 690 to 710, and from stations 745 to 750, along the Chicot front; and the enlargement of Two Mile Loop stations 785 to 798.

Below Arkansas City to the State line, with the completion of your work at Fulton Lake, from stations 1039+30 to 1080, under contract to G. B. Vaughan, and the other work under contract and provided for by the General Government, the line should, at the end of this levee season, stand from two and one-half to three feet above the high water of 1897, with proportionately ample cross-sections.

Your enlargement work on the Arkansas City Loop Levee and the Fulton Lake Levee, will, in all probabilities, be completed within the present month.

Recurring to the work, which we believe at this time your Board should undertake this season, to assist in placing all parts of the line in Arkansas, upon which the district is depending for protoction, upon a uniform basis of security, we have the following:

| | Cubic Yards |
|---|---|
| O'Possum Fork banquette, station 370+76 to 379+53.....about | 10,000 |
| Chicot front, station 677 to 690, new levee, and station 690 to 710, and 745 to 750, enlargement..... " | 62,000 |
| Two Mile Loop, station 785 to 798, enlargement..... " | 10,000 |
| Total..... | 82,000 |

The O'Possum Fork Loop Banquette can be built as part of your O'Possum Fork south enlargement work, under contract with J. E. Moore, Mr. Moore having agreed, if acceptable to your Board, to undertake it as such. This is respectfully recommended, leaving but two contracts to be advertised and let, those embracing the work on the Chicot Front and the Two Mile Loop, which is recommended for advertisement and contract at your earliest possible convenience.

The repair work, resodding and weed cutting, authorized last month by your Board, is being attended to by Mr. Tollinger, as arranged.

In this connection, Mr. Tollinger asked if it might not be possible for your Board to contribute something towards draining the battures below the old cotton compress, below Arkansas City. He proposes to place, at a suitable point, a tile drain, connecting the pits along the base of the levee with the river, and estimates the cost at about $1,000.00.

It is very desirable that this work be done, and it is recommended that your Board authorize Mr. Tollinger to proceed with it, agreeing to pay a part of the cost, not exceeding, say $500.00.

The total cost of the work herein recommended to you, as at present advisable to be done, should not exceed $12,500.00.

This is a small amount compared with the value of the interests at stake, and the amount of work in hand and contemplated, in the same

interest, by the General Government. But this should not be accepted as indicative of such an improved condition of affairs as to warrant your underestimating the heavy demands you may be called upon to meet in the future, by reason of changes of conditions.

Improved grades and sections will become necessary from time to time, and caving banks, at one point and then another, continue, and must sooner or later affect the integrity of the levee line in many localities, and require from all those in interest, strenuous efforts and large means to provide for the work which may be involved.

In the meantime, the existing line of levee should be judiciously cared for, and maintained and preserved to the best of your judgment and ability, reserving your larger means and resources for the amplified work you may be called upon to contribute towards in the future.

In conclusion, I would refer to your resolution requesting the Board of State Engineers "to ascertain the mileage of all the railroads in the Tensas Basin Levee District subject to overflow, and report same to the Board."

This matter was taken in hand by the Board of State Engineers, and a conference in regard to it had at Monroe last month with members of your Board.

At that time it was thought that certain information, maps, profiles and other data could be obtained by your Board, upon which a conclusion in the premises could be based without the necessity of further examination and survey, and it was understood that all information of this kind obtainable, would be forwarded to the Board of State Engineers for consideration.

So far, the Board of State Engineers has heard nothing further on the subject, except through a letter from Mr. Hicks, of your Board, giving certain partial information.

The Board of State Engineers would be glad to know what your further pleasure in the matter may be.

Very respectfully,

BOARD OF STATE ENGINEERS,
Per F. M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 30, 1898.

*Col. T. G. Sparks, President,*
*Atchafalaya Basin Levee District, Musson, La.:*

DEAR SIR—Day before yesterday, on April 28th, I went to the Guitreaux crevasse, just below Raceland. There I met Mr. Williams, and together we examined the crevasse. It is situated very nearly one mile below Raceland, and at the time of my visit it was about 80 feet wide. From all I can ascertain it has increased in width but very little, and the probabilities are that it will not increase in width rapidly. It

is not letting in very much water compared to the Babin crevasse of last year which became 317 feet wide. Therefore, it will not injure as much territory as would be the case if it were letting in much more water, or were it as large as the Babin of last year. Moreover, the bayou is going to fall very shortly, in fact, it is probably falling now from natural causes, and therefore the amount of water entering will be steadily diminishing, while in the case of the Babin last year, the amount was increasing for some time after it broke, owing to the fact that the river kept on rising some two or three weeks after occurrence of the crevasse.

The people in the immediate vicinity of the Guitreaux crevasse, who are already under water, do not wish the crevasse closed, as they say that all of the damage is already done, and now they want to be benefited at least by a deposit of sand on their land.

Very truly yours,

ARSENE PERRILLIAT,

*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 30, 1898.

*Col. T. G. Sparks, President A. B. L. D., Musson P. O., La.:*

DEAR SIR—Yesterday Mr. Williams and I rode over the levees on Bayou Lafourche. The water was very high at Raceland, being some two inches higher than the high water mark of the past. Since the crevasse, which had taken place on the Lafourche Basin side, and which had relieved the bayou temporarily, the water had risen again, regaining the fall which had taken place and exceeding it by a considerable amount The situation I considered very critical yesterday, as the wind was very high and the waves were lashing over the capping, which had been rapidly put up by the convicts and the people. Yet everything was being done that could possibly be done.

Upon my return here I received a telegram informing me that a crevasse had taken place on our side about a mile below Raceland. I do not see how it could have been avoided, as yesterday, during my ride over some twelve miles of levees, I saw two or three crevasses which I thought imminent, and in fact Mr. Williams and I stopped a crevasse where the waves had worn a hole through the capping. I believe that the bayou could have been held had it not been for the wind storm of yesterday, but with the very flimsy capping and the strong waves the situation was practically desperate.

Mr. Delaune has wired me, "to come and take steps to close the crevasse." I have referred him to Mr. Williams as the representative of the Board, but I presume no attempt will be made by the Board to close it. The water is going to fall naturally on Bayou Lafourche within thirty-six hours. It seems to me that the fall will be so rapid that it is not worth while to attempt closing the crevasse.

Very truly yours,

ARSENE PERRILLIAT,

*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 15, 1899.

*Hon. Hunter C. Leake, President, Board of Commissioners, Pontchartrain Levee District, New Orleans, La.:*

DEAR SIR — At your request, I have made a recent inspection of the levee line from College Point, St. James parish, to the lower limits of your district, in distance over fifty-three miles. I find that the levees, with few exceptions, are not very badly wave-washed, nor are they very dirty from the growth of weeds, bushes, etc. For your information, I have made a detailed statement of their present condition. In the following enumeration the United States profiles and maps are made use of, as they are the most authentic, being of recent date.

ST. JAMES PARISH.

| STATION TO STATION | Length in feet | REMARKS |
|---|---|---|
| 3742 —3760.... | 1,800 | From angle in levee below College Point, U. S. Gauge. Levee quite dirty in front of Jefferson College property. |
| 3760 —3800.... | 4,000 | Levee quite dirty. Barrow pits should be drained in front of Home Place Settlement. |
| 3800 —3850.... | 5,000 | Levee fairly clean in front of Home Place Settlement. |
| 3850 —3890.... | 4,000 | Levee quite dirty. Barrow pits should be drained in front of Oneida Plantation. |
| 3890 —3909.... | 1,900 | Levee fairly clean in front of Oneida Plantation. |
| 3909 —3948.... | 3,900 | Levee fairly clean. Belmont crevasse pond should be drained. |
| 3948 —4044... | 9,600 | Levee fairly clean. Barrow pits should be drained. This stretch covers front of Hester, and parts of Oneida and Bourbon plantations. |
| 4044 —4083.... | 3,900 | Levee very dirty. This covers stretch of raised levee under District Quigly Contract, known as St. Elmo Raising, and extends partly on Bourbon and St. Elmo Plantations. Barrow pits should be drained. |
| 4083 —4230.... | 14,700 | Levees are fairly clean. Battures high. A few scattered barrow pits should be drained. This stretch extends from St. Elmo to Lutcher. |
| 4230 —4269.... | 3,900 | From Lutcher to angle of levee in front of Red Hot Store just below David Plantation, levee fairly clean, high batture. |
| 4269 —4303..... | 3,400 | From lower line of David Plantation to lower line of Golden Grove. In front of Grammercy Sugar Refinery levees are slightly dirty. Barrow pits here and there should be drained. |
| 4303 —4358+15 | 5,515 | From lower line of Golden Grove to lower line of Sport or lower line of parish, levees are fairly clean. Scattering barrow pits should be drained. |

ST. JOHN PARISH.

| | | |
|---|---|---|
| 4358+18—4416+19 | 5,800 | From upper end of parish to Angelina Quarters, levees fairly clean; high batture. |
| 4416+19—4447+98 | 3,180 | Angelina levee, built by State in 1893, levee fairly clean. Barrow pits in front should be drained. |

ST. JOHN PARISH—CONT'D.

| STATION TO STATION | Length in feet | REMARKS |
|---|---|---|
| 4447+98—4455+76 | 800 | Levee in front of Chenets badly wave-washed and very much exposed: about 175 feet of bank left. It is likely that a new levee will be required to cover this stretch before many years. The wave-wash should be restored and well sodded, and even then I believe some protection work will be required at a high water stage. |
| 4455+76—4467.... | 1,124 | Levee not so exposed. Present revetment could be repaired and protect existing levee until new levee is built. |
| 4467 —4486.... | 1,800 | High batture; levee fairly clean. |
| 4486 —4517.... | 3,100 | Levee fairly clean. Barrow pits should be drained. |
| 4517 —4730.... | 21,300 | From Esperance Point, on Hope Plantation, to lower line of Reserve, in front of St. Peter's Church, the levees are fairly clean, with a very few scattering ponds to drain. |
| 4730 —4840.,.. | 11,000 | In front of Settlement, below St. Peters Church, to upper line of Belle Pointe Plantation, the levees, while fairly clean, are worn into by cross-paths, etc. |
| 4840 —4968.... | 12,800 | In front of Belle Pointe, Sunny Side and Laplace Plantations, the levees are dirty. Old barrow pits require draining. At upper end of Belle Pointe in places the levee is washed into, and the wave-wash should be restored. |
| 4968 —5005.... | 3,700 | Levee in front of Woodlawn Plantation, slightly dirty. Barrow pits scattering should be drained. |
| 5005 —5022.... | 1,700 | Levee slightly dirty. On exposed point subject to wave-wash, known as Louque levee, a new levee will be required at some future date to cover this stretch. Was revetted for last high water. |
| 5022 —5038.... | 1,600 | Levee slightly dirty. |
| 5038 —5057.... | 1,900 | Levee very dirty. Barrow pits in front should be drained; not very difficult to do so. This is at the upper end of the Bonnet Carre Crevasse Levee. |
| 5057 —5128.... | 7,100 | Bonnet Carre Crevasse Levee tolerably clean. Barrow pits in front should be drained; easily accomplished by cleaning out the old drain ditches excavated a year ago. |

ST. CHARLES PARISH.

| | | | |
|---|---|---|---|
| 5128 | —5212.... | 8,400 | From upper end of parish, levees in front of Anchor and Gypsy Plantations to Gypsy Point, are slightly dirty, with barrow pits scattering here and there, and easily drained. |
| 5212 | —5396.... | 18,400 | Levees in front of Roussel, Keller, Hermitage, Roseland and Diamond Plantations are tolerably clean, with high battures. |
| 5396 | —5434 .. | 3,800 | From angle above lower line of Diamond Plantation to Good Hope Store, levee low, slightly dirty, and barrow pits should be drained. |
| 5434 | —5494 ... | 6,000 | From Good Hope Store to angle of levee below Sarpy residence, levee badly wave-washed, and in stretches requires cleaning of weeds and removal of drift. |
| 5494 | —5506.... | 1,200 | Levee requires cleaning and batture draining. |
| 5506 | —5545.... | 3,900 | Sarpy Crevasse Levee. Pond in front should be drained. |
| 5545 | —5608.... | 6,300 | From lower end of Sarpy Crevasse to Ormond Point. Levees slightly dirty: ponds in front of Victoria and Ormond levees should be drained. |
| 5608 | —5665.... | 5,700 | Levees fairly clean; batture requires draining in spots. |

ST. CHARLES PARISH—CONT'D.

| STATION TO STATION | | Length in feet | REMARKS |
|---|---|---|---|
| 5665 | —5708.... | 4,300 | Levee in front of Destrehan Plantation, Judge Emile Rost, proprietor, is rain and wave-washed in spots caused by the overhanging branches from row of oak trees out on berme shading said levee. These branches should be lopped off, and levee restored to its original section; levee does not require much cleaning. |
| 5708 | —5734.... | 2,600 | Levee low and slightly dirty. Barrow pits in front of Modoc residence should be drained. |
| 5734 | —5780 ... | 4,600 | Levee low and dirty. Barrow pits in front of Modoc and Pecan Grove levees should be drained. |
| 5780 | —5825.... | 4,500 | Levee in front of Songy's slightly dirty. |
| 5825 | —5890.... | 6,500 | Levees in front of Crespo, Elkinsville and St. Rose Plantations, as far down as St. Rose residence are dirty, and scattering barrow pits should be drained. |
| 5890 | —5959.... | 6,900 | Levees in front of Almedia Plantation slightly dirty. |
| 5959 | —5980.... | 2,100 | From upper line of Fairview Plantation to Morgan's residence, levee dirty and barrow pits should be drained. |
| 5989 | —6025.... | 3,605 | From angle below Fairview residence to lower line of plantation and lower line of parish, levee quite dirty and barrow pits should be drained. |

JEFFERSON PARISH.

| | | | |
|---|---|---|---|
| 6025 | —6080.... | 5 500 | From upper line of parish to Cottonwood Box and Lumber Co., at Hanson City, levee dirty and barrow pits should be drained. |
| 6080 | —6150.... | 7,000 | Levees in front of Kennerville slightly dirty. High batture. |
| 6150 | —6200.... | 5,000 | Trudeau levee slightly dirty. High batture, in front of Trudeau residence. Barrow pits should be drained. |
| 6200 | —6231.... | 3,100 | Sauve levee dirty. Batture low with standing water against levee; should be drained. |
| 6231 | —6271.... | 4,000 | From lower line of Sauve to upper line of Boisblanc in front of Albert Spies and Weckerling farm, levee dirty: high batture, caving bank. It is a question of a year or so when this front will require a new levee. |
| 6271 | —6293.... | 2,200 | Boisblanc levee slightly dirty. Barrow pits should be drained. |
| 6293 | —6305.... | 1,200 | Levee in front of Perkins badly wave-washed; very much exposed. A new levee will be necessary here at some future day. |
| 6305 | —6343.... | 3,800 | From upper line of Tchoupitoulas plantation to Soniat residence, levees slightly dirty; high batture. |
| 6343 | —6380.... | 3,700 | Levees below Soniat residence very dirty. Barrow pits should be drained. |
| 6380 | —6420.... | 4,000 | Levees in front of lower end of Soniat's, Favorole and Southern University property to Yazoo & Mississippi Valley track, slightly dirty. Barrow pits should be drained. |
| 6420 | —6472.... | 5,200 | Levees in front of Lafreniere and Elmwood plantations, dirty. Barrow pits here and there should be drained. |
| 6472 | —6630 ... | 15,580 | Levees in front of Labarre, White Hall, Rosendale, Oaklawn, Skidmore plantations and South Port are slightly dirty. |

Very respectfully,
SIDNEY F. LEWIS,
*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 7, 1898.

*To the Honorable President and Members of the Lafourche Basin Levee District:*

GENTLEMEN—I beg leave to report for your information that under the terms and conditions of the Mississippi River and Bayou Lafourche contract, dated January 11, 1898, I have signed, up to date, certificates amounting to 61,999 cubic yards, at a cost of $8,540.14, or about .1377 cents per cubic yard. In addition to this yardage, notes have been furnished under this contract in accordance with resolutions of your Board for the construction of the following levees:

| Name of Levee. | | Parish. | Approx. Yardage. |
|---|---|---|---|
| Sec. No. 4. | Woodlawn | Assumption | 48,000 |
| Sec. No. 9. | Lockport to Lagarde | Lafourche | 38,000 |
| Sec. No. 9. | Lagarde to Barilleaux | Lafourche | 65,400 |

Amounting to upwards of 151,400 cubic yards.

I have, also, in accordance with resolutions passed at various meettings of your Board, set stakes for the following levees:

| NAME OF LEVEE | PARISH | APPROX. CUBIC YARDAGE | REMARKS |
|---|---|---|---|
| Star, Mississippi River | St. Charles | 70,000 | New levee to replace old levee—caving of river bank. |
| Ashton, Mississippi River | " | 100,000 | New and enlargement. |
| Bayou Lafourche—Truxillo, Sec. No. 2 | Assumption. | 24,000 | New and enlargement |
| Ferraf, Sec. No. 2 | " | 37,500 | New and enlargement. |
| Capt. Charlet, Sec. 3. | " | 10,500 | Enlargement. |
| Aucoin to Juge, Sec. 3 | " | 25,000 | Enlargement. |
| Juge to Lallande, Sec. No. 3. | " | 28,000 | Enlargement. Newlevee would require 46,000 cubic yards. |
| Ingleside to Albermarle, Sec. No. 4 | " | 150,000 | New levee. |
| Albemarle to Cedar Grove, Sec. No. 4 | " | 35,500 | Enlargement. |
| Cedar Grove to Cleveland, Sec. No. 4 | " | 26,000 | Enlargement. |
| Folse, Sec. No. 4 | " | 22,500 | New. |
| Himel to Labadieville Ferry, Sec. No. 4 | " | 50,000 | New. Bank very steep. |
| Labadieville Ferry to Cooper Shop, Sec. No. 4 | " | 56,000 | New. Some bank. |
| Gossin Store, Sec. No. 6 | Lafourche. | 72,000 | New levee to cover bad sloughing of old levee |
| Mary to Lyall, Sec. No. 8 | " | 75,000 | New and enlargement. |
| Lagarde Warehouse, Sec. No. 9. | " | 15,000 | New. |
| Jos. Boudreaux, Sec. No. 9 | " | 25,000 | New and enlargement. |
| Telemaque Badeaux, Sec. No. 9. | " | 94,000 | New. |
| Tresimond Foret, Sec. No. 9 | " | 95 000 | New and enlargement. |
| Ragan, Sec. No 9 | " | 29,000 | New. |
| Adler Front, below canal | " | 94,000 | New. |

RECAPITULATION:

| | Cubic Yds. |
|---|---|
| St. Charles Parish, Mississippi River | 170,000 |
| Assumption Parish, Bayou Lafourche | 465,000 |
| Lafourche Parish, Bayou Lafourche | 499,000 |
| Total | 1,134,000 |

Very respectfully,
SIDNEY F. LEWIS,
*State Engineer, in charge.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 13, 1898.

*To the Honorable Board of Commissioners,*
*Lafourche Basin Levee District, New Orleans, La.:*

GENTLEMEN—Upon receipt of a copy of the resolution passed at your meeting of September 6th, relative to the dredge work now being done by the Atchafalaya Basin Levee Board on Bayou Lafourche, and calling attention to the cracks in the batture on the left bank of the Bayou at Telemaque Badeaux's place, about six miles below Lockport, and elsewhere, the Board of State Engineers proceeded, as requested, to examine the situation, and now respectfully reports for your information the following facts and conclusions in the matter.

The enlargement of levees on the Atchafalya Basin side of the bayou, by means of dredging, has undoubtedly caused caving of the banks at certain places, and has probably increased the tendency to cave, already existing at some other places. Most of the caving, however, has been on the Atchafalaya Basin side, and thus far has done no damage to levees on the Lafourche Basin side of the bayou. At Telemaque Badeaux's the bayou is narrow—evidently too narrow to permit any considerable amount of material to be dredged from its bottom without making its banks so steep as to cause danger of caving, and the dredging already done has been followed by extensive caving of the banks on the Atchafalaya Basin side, and by a re-opening of old cracks and increased settlement of the batture on the Lafourche Basin side. This cracking and settlement of the batture on the Lafourche Basin side, is only noticeable near the lower end of the stretch along which the dredge work was done, and thus far has not encroached upon your levees.

The Board of State Engineers was accompanied on its inspection by Mr. Kent, of your Board, and by a committee of the Atchafalaya Basin Levee Board.

This committee, recognizing the danger that may arise to your levees, as well as to their own, from any further deepening of the bayou in this narrow portion, decided to dredge no more earth from the bottom of the bayou either in this stretch or in any other place where the bayou appears so narrow that it cannot be safely deepened, and determined to limit dredging operations to those localities where this character of work can be carried on without detriment to existing levees on either side of the bayou.

It is hoped that this conclusion may prove satisfactory to all parties concerned.

Very respectfully,
THE BOARD OF STATE ENGINEERS,
Per HENRY B. RICHARDSON,
*Chief State Engineer.*

P. S.—A copy of your resolution above referred to and of this letter has been sent to the Atchafalaya Basin Levee Board.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., December 14, 1898.

*To the Honorable Members of the Joint Committee, representing the Atchafalaya Basin and Lafourche Basin Levee Districts, New Orleans, La.:*

DEAR SIRS—In compliance with the resolution of your committee, dated December 2d, 1898, requesting the Board of State Engineers "to make an inspection of the levees on Bayou Lafourche and report to the Joint Committee of the Atchafalaya and Lafourche Levee Boards on the matter of the construction of levees by dredging, as is now carried on by the Atchafalaya Levee Board, on Bayou Lafourche," etc., the Board of State Engineers has the honor to say that the inspection was duly made, and now begs leave to report, as follows:

We understand that the purpose of the resolution is to obtain an expression of opinion from us, first, as to the effect so far produced upon the banks of Bayou Lafourche and upon the levees paralleling its banks, by the dredge work employed by the Atchafalaya Basin Levee District in enlarging its levees on the bayou; and second, as to the policy of continuing that method of obtaining material for such enlargement on Bayou Lafourche.

We find that in most of the localities where dredging from the bed of the bayou has been carried on to an extent sufficient to supply the full amount of material demanded for the section designed for the enlarged levee, the banks of the bayou, on one side or the other, and frequently on both sides, immediately opposite, have cracked and settled down to a greater or less degree, either during the progress of the work or very soon after its execution, and that this cracking and settling down is more frequent and more serious in its results in the narrower than in the wider parts of the bayou.

We find that, so far, this disturbance in the banks of the bayou has generally been limited in its reach, laterally, but that it has, nevertheless, been sufficient to extend up to and into the levee line at several places on the Atchafalaya Basin Levee District side and at a few places on the Lafourche Basin Levee District side. After the first *decided* movement, however, the disturbance seems in most cases to practically cease, under a continuance of normal conditions.

It appears conclusive that the extent of the disturbance of the banks is intimately associated with the amount of material removed from the bed of the stream, the proportion of the cut, and the proximity of the latter to, or its remoteness from, the one bank or the other.

Another influence, in our opinion, bearing largely upon the disposition of the banks to move, when their status quo, from one cause or another, is assailed, as well as upon the extent of disturbance which may follow, exists in the amount of deposit or material to be found in many places in a superimposed condition on the banks of the bayou

itself. A confirmation of this may be found in the fact that the banks of the bayou, notably where the battures are high and apparently overcharged with deposit, have cracked and settled down, comparatively recently, and from time to time in the past, in a number of places where no artificial deepening has been attempted. This, however, proves nothing beyond the fact that in these particular instances the banks of the bayou were already, from local causes, supersensitive to movement, and that dredge work would only have aggravated conditions and hastened the movement. Again, it is a fact that the cracks and subsidences of the banks occurring in one season, have, in many instances, been obliterated by accretion during the next season.

It seems conclusive that any active agent tending to disturb the bed of the bayou to any serious extent, affects, more or less, the stability of its banks, and it naturally follows that in the narrower lengths of the bayou, where the distance between the opposing levees and the widths of batture are limited, danger to the levee lines on *both* banks, lurks, to an imminent degree, in the wake of dredging from the bed of the stream; as the width of the bayou, and of the battures, and the distance between the levees improves, however, the risk to the levee lines diminishes—the levees on that bank possessing the greater width of batture being the more secure from disturbances of the character in question.

The section of Bayou Lafourche varies greatly in different parts of its length, the most marked characteristic in this respect being to gradually diminish from its source towards its mouth, the stretches of comparatively uniform section extending from Donaldsonville to about Lafourche Crossing, from there to Lockport, and from the latter point towards the mouth.

We are, therefore, led to conclude that, between Donaldsonville and Lafourche Crossing, dredge work, under certain specific restrictions, is permissible, in a number of *selected* localities, without necessarily jeopardizing the lines of levee on its banks, between Lafourche Crossing and Lockport, the opportunity for selecting promising localities for this character of work is limited; and that below Lockport, as far as levees extend, but few, if *any* localities exist, where dredging from the bed of the stream can be carried on without danger to the levees. Dredging from high battures, under specific restrictions, during such stages of the bayou as would render it practicable for floating plants, or during low stages, by means of *land* dredges, or steam shovels, can, in our opinion, be carried on as safely as with the ordinary scraper and wheelbarrow.

It is possible that some of the effect of the dredge work so far carried on by the Atchafalaya Basin Levee District on Bayou Lafourche, is partly due to the insufficiency of the specifications prescribed, and partly to the failure of the operators, in some instances, to fully observe the latter.

The extent of the disturbance of the banks of Bayou Lafourche, resulting from the experiment to enlarge levees with material taken, by dredges from the bed of the bayou, is so far greater in the Atchafalaya Basin Levee District than in the Lafourche Basin Levee District. But *one* stretch of improved levee in the Lafourche Basin Levee District has so far been materially affected by the cracking and subsiding of the banks of the bayou where dredge work has been carried on. This is along the Skelly Front, and it is our opinion that a part of this line should be covered by a new levee.

There are other fronts in the Lafourche Basin Levee District, on Bayou Lafourche, such as the Mary, Georgia and Celina places, where the original project for improving the levees, on account of cracks and subsidencies of the bank, where dredging has been done, may require changes, the extent of which can be better determined after a reasonable length of time has been permitted for further developments.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,
Per HENRY B. RICHARDSON,
*Chief State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 6, 1898.

*To the Honorable President and Commissioners*
*for the Grand Prarie Levee District:*

SIRS—In anticipation of your organization, and in order to furnish your Board with information and data as to the present condition of your existing levee line fronting the river, we have had a preliminary survey made of these levees. From the records of this survey, we find the length of your levee line to be 124,890 feet, or 23.65 miles, which we have divided into five sections as follows:

| SECTION | FEET | MILES | REMARKS |
|---|---|---|---|
| No. 1..... | 24,615 | 4 66 | Extends from lower end of Bohemia to Nestor Canal. |
| No. 2..... | 28,535 | 5.41 | Nestor to Matulich Canal. |
| No. 3..... | 25,850 | 4.89 | Matulich Canal to Nicholls P. O. |
| No 4. .... | 26,690 | 5.05 | Nicholls P. O. to Polite Canal. |
| No 5... . | 19 200 | 3.64 | Polite Canal to Fort St. Philip Reservation. |
| Total.... | 124,890 | 23 65 | |

We have also prepared a table of approximate yardage, basing our estimate on a section of earthwork of 6 foot crown, slopes 3 and 3 to 1, and with a net grade corresponding to that as adopted by the Mississippi River Commission, and to which all existing levee organizations, both United States and State, are striving to attain.

APPROXIMATE YARDAGE OF EARTHWORK REQUIRED

To build, raise and strengthen levees in the Grand Prairie Levee District on the Mississippi River, from the lower line of Bohemia to the upper line of the United States Reservation for Fort St. Philip, to a standard grade adopted by the Mississippi River Commission and the State of Louisiana, that is (3.3 feet at upper end of the district and 3 feet at its lower end above H. W. '93) with crown 6 feet and side slopes of 3 on 1.

SECTION NO. 1—FROM BOHEMIA TO NESTOR CANAL.

| FROM STATION TO STATION | Linear Feet | | Cubic Yards of Earthwork in | | REMARKS |
|---|---|---|---|---|---|
| | New Levee | Enlarg't. | New Levee | Ras. and Enlarg't. | |
| 0 to 30 | ..... | 3,000 | ..... | 7,710 | Bohemia to Chas. Fox's lower line. |
| 30 to 161+45 | 7,424 | 5,721 | 41,500 | 16,790 | Chas. Fox's lower line to Williams' Cave. |
| 161+45 to 213+45 | 5,200 | ..... | 24,000 | ..... | Williams' Cave to Winn's Canal. |
| 213+45 to 246+15 | ..... | 3,270 | ..... | 13,300 | Winn's Canal to Nestor Canal. |
| Total..... .. | 12,624 | 11,991 | 65,500 | 37,800 | |

SECTION NO. 2—NESTOR CANAL TO MATULICH CANAL.

| | | | | | |
|---|---|---|---|---|---|
| 246+15 to 374+30 | ..... ... | 12,815 | ..... ... | 51,000 | Nestor Canal to Oliver Cannon. |
| 374+30 to 484+75 | ..... .... | 11,045 | ... .... | 48,000 | Oliver Cannon to Daisy P. O. |
| 484+75 to 531+50 | ..... | 4,675 | ..... | 15,800 | Daisy P. O. to Matulich Canal |
| Total..... .... | ..... | 28,535 | ..... | 114,800 | |

SECTION NO. 3—MATULICH CANAL TO NICHOLLS' P. O.

| | | | | | |
|---|---|---|---|---|---|
| 531+50 to 552+50 | 2,100 | ..... | 9,500 | ..... .... | Matulich Canal to Harris Canal. |
| 552+50 to 656 | 10,350 | ..... | 47,900. | ..... | Harris Canal to Hack's Bayou. |
| 656 to 694+60 | 3,860 | ..... | 14,000 | ..... | Hack's Bayou to Dick Wright's. |
| 694+60 to 715+30 | ..... | 2,070 | ..... | 5,600 | Dick Wright's to Chas. Buck's. |
| 715+30 to 735+10 | ..... .... | 1,980 | ..... | 7,900 | Chas. Buck's to Harry Gilmore. |
| 735+10 to 790 | ..... .... | 5,490 | ..... | 20,800 | Harry Gilmore to Nicholls' P. O. |
| Total..... | 16,210 | 9,540 | 71,400 | 34,300 | |

SECTION NO. 4—NICHOLLS' P. O. TO POLITE'S CANAL.

| | | | | | |
|---|---|---|---|---|---|
| 790 to 821 | ..... | 3,100 | ..... | 10,750 | Nicholls P. O. to Kouns' lower line. |
| 821 to 912 | ..... | 9,100 | ..... | 32,500 | Kouns' lower line to J. B. Fasterling lower line. |
| 912 to 970 | ..... | 5,800 | ..... | 23,500 | J. B. Fasterling lower line to B. Hayden upper line. |
| 970 to 1003 | ..... | 3,300 | ..... | 14,500 | B. Hayden's upper line to Quarantine Canal. |
| 1003 to 1033+10 | ..... | 3,010 | ..... | 10,200 | Quarantine Canal to Cuserlich Canal. |
| 1033+10 to 1056+90 | 2,380 | ..... | 11,000 | ..... | Cuserlich Canal to Polite's Canal. |
| Total. ..... | 2,380 | 24,310 | 11,000 | 91,450 | |

SECTION NO. 5—POLITE'S CANAL TO FORT ST. PHILIP.

| | | | | | |
|---|---|---|---|---|---|
| 1056+90 to 1079+45 | 2,255 | ..... | 9,000 | ..... | Polite's Canal to Tom Brophy's. |
| 1079+45 to 1153+80 | 5,295 | 2,140 | 19,500 | 5,000 | Tom Brophy's to Emile Buras. |
| 1153+80 to 1177 —Booth's | 1,595 | 735 | 8,000 | 1,700 | Emile Buras to Dr. Booth's. |
| 1177 to 1248+90 | ..... | 7,190 | ..... | 23,100 | Dr. Booth's to Fort St. Philip. |
| Total..... | 9,145 | 16,065 | 36,500 | 29,800 | |

RECAPITULATION.

| | Linear Feet | | Cubic Yards of Earthwork | |
|---|---|---|---|---|
| | New Levee | Ras. and Enlarg't. | New | Levee Enlarg't. |
| Section No. 1 | 12,624 | 11,991 | 65,500 | 37,800 |
| Section No. 2 | ..... | 28,585 | ..... | 114,800 |
| Section No. 3 | 16,211 | 9,540 | 71,400 | 34,300 |
| Section No. 4 | 2,380 | 24,310 | 11,000 | 91,450 |
| Section No. 5 | 9,145 | 10,065 | 36,500 | 29,800 |
| Total | 40,360 | 84,441 | 184,400 | 308,150 |

Respectfully submitted,
THE BOARD OF STATE ENGINEERS,
Per SIDNEY F. LEWIS,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 7, 1898.

*Hon. W. C. Vance, President Board of Commissioners,*
*Bossier Levee District, Shreveport, La.:*

DEAR SIR—The Board of State Engineers would most respectfully call your attention, at your meeting to-day, to the following localities in your district where the levee line is threatened by caving, viz: at Taylor's, Ogden's, Cal. Vance's, Buck Hall, Cash Point, Shady Grove, Pat. Cash's and Dillard's.

At Taylor's, Ogden's, Cash Point Shady Grove and Dillard's the danger is immediate, and at the other localities approaching at an early date.

All of the localities named, are, as you are aware, above Shreveport, no part of the levee line extending below Shreveport being yet seriously in danger from caving banks, though at several localities the inroads made upon the river bank by caving have been very great, and likely to be greater.

The number of cubic yards of earthwork which, from present indications, will this season be involved in the construction of new levees in the district in consequence of caving banks, cannot well fall short of 275,000, and provision should be made by your Board at as early a date as possible for putting at least that amount of levee work under contract.

Since your last meeting, the State has completed levee work in your district, at Cash Point, Jeter's, Colquitt's, Gilmer Lane, Fullilove's and Nicholson's, amounting to 212,651 cubic yards, and costing $23,727.11. Of this amount, $6,869.86 was, by agreement with contractors, paid by warrant issued in anticipation against such aid as the State might be able to accord your district for the year 1898, and to be charged thereto.

In regard to the ability of the State to assist your district in the execution of levee work required in the district this season, the Board

of State Engineers cannot at this time definitely speak, as the appropriation bill specifying its resources for the current year has not yet been promulgated; but it is hoped that as much as $14,000.00 may be available before the expiration of the year. From this, however, the amount anticipated, $6,869.86, remains to be charged, as stated before,

In this connection, the Board of State Engineers would be pleased to learn from you at an early date at what localities your Board is likely to undertake work, in order that such as you may not be able to do may be taken under consideration by the State, as far as its limited means may permit.

The Board of State Engineers is again constrained to call your attention to the continued absence of any organized measure in the district looking to the proper care, preservation and protection of your line of levees.

Any service that this Board can in any way render you at any time will with pleasure be promptly attended to.

Very Respectfully,
THE BOARD OF STATE ENGINEERS,
Per FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., November 14, 1898.

*To the Honorable Members, Board of Commissioners,*
*Bossier Levee District, Benton, La.:*

SIRS—Last week, in company with Major J. H. Willard, United States Engineer in charge of public improvements on Red River, and Major Henry B. Richardson, Chief State Engineer, I made a tour of inspection over the greater part of the levee line in your district.

The appearance of the line, as a whole, was encouraging; but in a number of places weeds and trees are gaining great headway upon the embankment, much to its present deterioration, and, unless the evil be promptly remedied, its ultimate injury and possible jeopardy. Again, in a number of places, the embankment has been disfigured by travel, and at several points hogs were seen actively engaged in the work of demolishing it.

But it is not my intention, at this time, to dwell long on this part of the work forcibly presenting itself for attention on the part of your Board, but to again call your attention to several points in the district where your line, judging from the present proximity of the river bank to the line, and the rapid rate of caving that has occurred, is very shortly seriously threatened with breaches from encroaching river banks. These points are at Ogden's, Cal. Vance's, Buck Hall, Cash Point, Shady Grove, Pat. Cash's and Dillard's, above Shreveport, and Hall's, below. The *most* threatened of these points, however, are at

Ogden's, Cal. Vance's, Cash Point and Shady Grove, and there is no doubt but that the safety of the district imperatively demands that steps should be at once taken to provide new levees at each of them.

The State has already built, this season, a new levee at Taylor's to cover a threatened breach in the line at that place, and has at present the levee required at Shady Grove advertised for construction. This is the utmost your district can rely upon the State doing in the district out of this year's levee funds.

The construction of the other new levees, namely, at Ogden's, Cal. Vance's and Cash Point, cited as immediately necessary in the district, will involve payment for as much as 150,000 cubic yards of earthwork, and the Board of State Engineers earnestly recommends that you promptly meet and provide means for executing it, urging that your failure to do so will subject the district to grave risks.

Very respectfully submitted,

THE BOARD OF STATE ENGINEERS,
Per FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS LA., January 17, 1899.

*Hon. J. W. Jeter, President, Board of Commissioners,*
*Bossier Levee District, Brownlee P. O., La.:*

DEAR SIR—The condition of affairs at Cal. Vance Levee, likely to result from a failure to promptly provide for the construction of a new levee at that point, leads me to address you directly upon the subject, particularly as my communication of November 14th, 1898, to the Board of Commissioners of the Bossier Levee District, on the same subject, does not seem to have impressed the Board with a due sense of the seriousness of the case.

As you know, the "Cal. Vance" levee is situated on the concave side of one of the most abrupt bends in Red River, above Shreveport.

The present line of levee there was built by the Bossier Levee Board in 1893, and at the time located generally at a distance not less than 500 feet from the river bank. Owing to continued excessive caving, the distance now is, for several hundred feet, less than 100 feet, with every indication of a further serious loss of the bank from caving, from which a breach in the line of levee, at no distant day, is imminent Conditions, in this direction, will also be largely aggravated by the present freshet coming down the river, which, from present indications, will at least reach a stage at which the rate of caving, in such situations, is greatly augmented.

A failure to maintain your levee line at *any* point in the district, would, in the event of a high water, approximating in proportion any of those in the past, prove a serious menace to the interests of the

district, but a failure to maintain the line at Cal. Vance's would, in such an event, render nine-tenths of the Bossier Levee District liable to inundation.

An impression seems to prevail among many in your district, that in the event of an emergency, large forces, furnished by interested proprietors in the district, can, in the event of breaches in the levee, be depended upon and made equal to providing protection by means of "run-rounds." Shiftless and uncertain as such a policy must necessarily prove in the long run, it *might* be temporarily effective in *certain* localities where the levee line is *small* and local conditions favorable; but in the present instance, the levee required is a large one, and the land upon which it must be built, pitches abruptly off into very low ground, and the only assurance of safety lies in promptly undertaking and pushing to completion a properly located and well designed line of levee.

I enclose you a sketch showing the relations between the river bank and the levee line at the time of the construction of the existing line of levee and those of the present day, and the approximate location for the new levee required, the contents of which I estimate at about 75,000 cubic yards.

I know your deep interest in the welfare of your district and appreciation of its needs, and therefore hope you may be able to obtain a favorable consideration of the matter from your Board.

It will interest you to know that since my last communication to the Bossier Levee District, dated November 14th, 1898, the State has let out for construction the new levee required this season at Shady Grove and at Cash Point, which reduces the number of places reported in that communication as at present imperatively demanded to two, namely, at Ogden's and Cal. Vance's, for which provision has so far not been made; and I will add, that at this date it appears possible to defer the construction of the levee at Gordy Ogden's to a somewhat later date, thus reducing the amount of work for which the district should immediately provide to that required at Cal. Vance's.

I cannot refrain from again referring to the many abuses to which the levees, in a great number of localities in your district are still continually being subjected by travel, by obstructions upon them, and by the rooting of hogs. No attempt either has ever been made by your Board to repair the damages sustained by the levees in many localities from these abuses, nor from rain and wave-wash, the growth of weeds, trees, etc., from the failure to replant Bermuda grass where it had failed to grow, and from the absence of proper drainage.

Provision should long ago have been made to prevent these abuses, and to supply the methods and means necessary for repairs; and continued inaction in these matters must eventually result in serious losses, if not disaster, to the district.

As also often assured the Bossier Levee Board, the Board of State Engineers will at any and all times be pleased to render every service in its power in rendering effective any measures formulated for the proper care, preservation and maintenance of the levees of the district.

Respectfully,

F. M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 27, 1899.

*Hon. J. W. Jeter, President, Board of Commissioners,*
*Bossier Levee District, Brownlee P. O., La.:*

DEAR SIR—Between September 14th and 22d instants, I made an inspection of the entire line of levee in your district, and believing that a statement of its condition, as found, would prove interesting and serviceable to the district, I have the honor to submit the following, prefacing the remarks with the explanation that the section described is compared with that to which the levee was originally built, and that the grade is generally three feet above the highest water known, locally, which, from the State line to the vicinity of the head of Bayou Pierre was the high water of 1892; from the vicinity of the head of Bayou Pierre to the vicinity of Knox Point, that of 1894; and from the vicinity of Knox Point below that of 1892 again.

ABRAM'S.

Grade, crown and slopes good. Practically clean and well turfed, but somowhat battered and worn opposite gin. One deficient ramp.

DIXON PLACE.

Grade, crown and slopes good. Recently cleaned off by district. Some bald places, and owing to previous weedy and overgrown condition, all parts not as well grassed as should be, but generally fairly well turfed. One deficient ramp.

DR. LASSITER.

Grade, crown and slopes good. Recently cleaned off by district, greatly improving condition of levee. Owing to previous weedy condition not all as well grassed as it should be. Requires grassing again.

ROUGH AND READY.

Grade, crown and slopes good, but somewhat worn in places. Bald in spots, but generally well turfed. Has been cleaned off by district lately, greatly improving the condition of the levee, large weeds and quite a growth of small cottonwood having previously taken possession of the levee. Banquette has not been cleaned off, but should be.

STINSON'S.

Grade, crown and slopes good, though section somewhat worn in places. Clean and well turfed. Two deficient road crossings.

RUSHING.

Grade, crown, slopes good. Weedy and bald in spots, but fairly turfed, except over new levee which is poorly grassed and should be replanted.

OGDEN.

Grade, crown and slopes good. Practically clean and well turfed. Caving. At one point only 110 feet bank. New levee will soon be required.

GOLD POINT.

Grade, crown, slopes good. Weedy in places, but generally clean and well turfed.

RIVERSIDE—(New Levee).

Grade, crown, slopes good and full. Weedy to some extent and poorly grassed. Should be regrassed.

BUCK HALL.

Grade, crown, slopes good. Weedy in places and stretch along in front of improvements somewhat worn and bald, but generally clean and well turfed. Several pathways and two bad ramps about opposite old store. Caving along in front of improvements. 135 feet bank.

CASH POINT.

Grade, crown, slopes good. Clean and well turfed. Two deficient ramps.

SHADY GROVE.

Grade, crown, slopes good, except for about 500 feet above Benoit Bayou, where the section has been battered and worn by hogs and stock in the past. Deficient road crossing at lower end new levee; that is, wagons are being crossed without ramp or other protection to levee.

BENOIT BAYOU.

Grade, crown, slopes good. Couple of trees on land slope, but otherwise fairly clean and well turfed. Deficient ramp upper and lower side dike.

PANDORA.

Grade, crown, slopes good, though latter somewhat worn along upper half of levee by stock before grassing. Clean and well turfed. Deficient ramp and bad pathway at upper end near Benoit Bayou.

ARNOLD.

Grade, crown, slopes good. Clean and well turfed. Deficient ramp.

CARMOUCHE.

Grade, crown, slopes good, but scant as compared with newer levees. One or two small cottonwood, and slightly weedy in spots, but generally clean and well turfed. Bad pathway at angle at lower end of levee. Ditto upper end.

JETER.

Grade, crown, slopes good. Clean and well turfed. Two pathways not serious.

COLQUITT'S.

Grade, crown, slopes good. Somewhat weedy for a short stretch in extreme point, but generally clean and well turfed. Short stretch just below residence somewhat worn, but not seriously injured.

PAT. CASH.

Upper part of place, grade, crown, slopes good. Clean and well turfed. Lower part, deficient in grade, crown and slopes. Recently cleaned off and partially repaired by district. Still weedy in places and entirely bald of grass Deficient road crossing. This part of line has never been improved by district, but has been maintained by Mr. Cash.

HOLLINGSWORTH.

Grade, crown, slopes good. Clean and well turfed. Pathways and roadways being filled by district.

WILLIAMS.

Grade, crown, slopes deficient. Clean and well turfed. Unimproved levee. Dangerous road cut.

DILLARD'S.

Grade, crown, slopes deficient. Recently cleaned off by district. Bald throughout. Unimproved. Requires new levee. Caving bank into slope of levee, just below residence; two deficient ramps.

DILLARD'S TO BOSSIER CITY.

Grade, crown, slopes good. Clean and well turfed. Lower end, back of saw mills, being abused by crossing of wagons, without ramps, slabs and strips piled on slopes and bridge over slope and crown. These mills will sooner or later be a source of danger to the levee. Four dangerous pathways.

BOSSIER CITY.—(Occupied by switch).

Grade, crown and slopes good. Weedy but well turfed. Culvert through switch bank at lower end required.

RAILROAD TO DAUGHTERY'S.

Grade, crown and slopes good. Clean and well turfed. Deficient ramp just below railroad.

DAUGHTERRY'S.

Grade, crown and slopes good. Clean and well turfed. Deficient ramp at angle upper side Vinson Bayou.

VINSON.

Grade, crown and slopes good. Fairly clean and well turfed. Considerable caving all along line; only 130 feet bank opposite center of place.

BELCHER'S.

Above dike: grade, crown and slopes good. Slightly weedy but well turfed. Several pathways.

At dike: grade good, but crown and slopes badly disfigured by hog-roots, rain-wash and travel. Dangerous road cut through levee at angle upper side of dike. Recently cleaned off and fairly well turfed.

ALEXANDER & BLANCHARD'S.

Line mostly in fair condition, but part of it disfigured and worn by old hog-roots, rain-wash and travel. Land slope considerably cut into by wagons. Weedy in places, but otherwise fairly well turfed. Several pathways.

MACK'S BAYOU.

Grade good, but crown and slopes worn by old hog-roots, rain-wash and travel. Fairly well turfed. Dangerous road cut.

SCHENICK'S BAYOU.

Grade, crown, slopes good. Clean and well turfed.

CHALK LEVEL.

Grade, crown, slopes good. Clean and well turfed, except part of new levee at lower end which is weedy, and grass not well spread. (This may be on Clay Place).

CLAY.

Grade, crown, slopes mostly good, but land side steep on parts of line, and both slopes ragged in places. Levee badly disfigured and worn opposite houses and in point at upper end. Mostly clean and well turfed.

NICHOLSON'S.

Grade, crown, slopes good. Clean, and except where recently burnt off and a few bald places, well turfed. Two pathways.

UPPER SUNFLOWER.

Upper part: Grade, crown, slopes good. Clean and well turfed. Several pathways.

Lower part: Grade good, crown narrow; land side good, but river side only 2 to 1. Clean and well turfed.

LOWER SUNFLOWER.

Grade good and fair section of earth, but crown ragged, land slope steep and ragged, and river slope wave-washed. All, however, clean and well turfed. Several bad pathways.

CURTIS.

Upper part: Grade, crown, slopes good. Clean and well turfed. Section somewhat reduced by rain-wash near extreme upper end. Dangerous crossing above bayou.

Lower part: grade, crown and river slope good, but land slope only about 2 to 1, and generally badly disfigured by old rain-washes and hog-roots. Several pathways. Two deficient ramps, and one dangerous road cut.

RICHMOND BAYOU.—(U. S. Levee).

Grade, crown and slopes good. Clean and well turfed.

PRUITT.—(U. S. and S. Levee).

Grade, crown, slopes full, though disfigured in spots by old hog-roots, rain-wash, etc. Clean and well turfed. Several pathways. Deficient ramp at angle below residence.

SUNNY POINT.

Grade, crown, slopes full, but badly disfigured in spots by old hog-roots. Clean and well turfed, though bald in spots. Deficient ramp at point about half way across point.

HALL.

Grade, crown and slopes good, though only 2 to 1 land side. Clean and well turfed. 150 feet bank upper end, 180 feet at lower end, and about 125 feet at a point about 200 feet below upper end.

CHILDER'S.

Grade, crown and slopes fair. Clean and well turfed, but very badly disfigured for most of its length from old hog-roots, stock, crossings and rain-wash. Deficient road crossing opposite residence.

SCOPINI.

Grade, crown, slopes full. Clean and well turfed. One pathway.

GRAPP-MERCER.—(U. S. Levee).

Grade, crown, slopes full. Clean and well turfed.

PICKETT'S.—(U. S. Govt. Levee).

Grade, crown, slopes good, clean and well turfed.

DORTCH.

Grade, crown, slopes good. Clean and well turfed. Deficient road crossing opposite residence and three pathways.

WATERLOO.—(Mercer's).

Upper half: section good, but more or less ragged and worn, as compared with balance of line, especially at gin and from there up. Several bad pathways and one deficient ramp.

Lower half: grade, crown, slopes good. Clean and well turfed.

MAGENTA.

Grade, crown, slopes full. A little weedy in places, but generally clean and well turfed. One deficient ramp.

GOLD DUST.

Grade, crown, slopes good. Somewhat weedy in places, but generally clean and well turfed. Least bank, at about site of old gin, 215 feet.

HOPEWELL.

Grade, crown, slopes good. Clean and well turfed. Two deficient roadways. Least bank 265 feet.

ELM GROVE.

Grade, crown, slopes good and clean. A few bald places, but generally well turfed.

WHITEHOUSE.

Grade, crown, slopes good. Clean and well turfed. One deficient roadway.

BATES PLACE.

Grade, crown, slopes good. Clean and well turfed. No material change in bank lately. 235 feet least width of batture.

KNOX POINT.

Grade, crown, slopes good. Clean and well turfed. Somewhat ragged and worn back of site of old gin, and several bad pathways. Just below site of old gin on batture, only about 200 feet bank left. Dangerous road crossing at upper line of place.

KNOX POINT TO LOVELY POINT.

Grade, crown, slopes good. Generally clean and well turfed. Recently cleaned off. Back of Knox Point store, and for 1,500 feet below, levee very ragged, worn and bald from old hog-roots, rain-wash, travel, herding stock, pathways and road crossings.

LOVELY POINT.

Grade, crown, slopes good. Clean and well turfed. Deficient ramp in lane at upper end of place.

FURNISS.—(Lovely Point to China Grove).

Grade, crown, slopes good. About 300 feet at lower end somewhat ragged from old hog-roots, but now turfed. Deficient roadway just above residence. A few bald spots, but generally clean and well turfed. Recently cleaned off. Slopes disfigured in spots by old pathways and rain-wash.

CHINA GROVE.

Grade, crown, slopes good. Clean and well turfed. A few bald places and ragged spots, especially opposite residence. Dangerous pathway just below lane. Deficient ramp in lane and levee badly worn by crossings.

FROM CHINA GROVE TO CHRISTIANA.

Grade, crown, slopes good. Weedy and considerable growth of young cottonwood. Well turfed. One deficient road crossing and two pathways.

A. J. MOSS.'—(Christiana).

Grade, crown and slopes good. At upper line of place badly disfigured and worn for about 100 feet by crossing, etc., but balance clean and well turfed. Angle at lower spur somewhat cut down by road crossing. Bad pathway at angle at upper spur. Some few small scattering cottonwood near lower end.

SIXTEENTH SECTION.

Grade, crown, slopes good. Weedy and overgrown in places with young cottonwood. Well turfed. One dangerous roadway.

The lower end of the line of public levee in your district ceases on the Sixteenth Section, leaving unleveed a length of line extending from that point down to the lower limits of the district, aggregating about twelve miles by the river.

Respectfully submitted,

F. M. KERR,

*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 3, 1900.

*Hon. J. W. Jeter, President, Board of Commissioners,*
*Bossier Levee District, Bossier City, La.:*

DEAR SIR—The Board of State Engineers has the honor to report that since the last meeting of your Board the State has found it possible to put under contract the levee work required at Dillard's, amounting to about 51 000 cubic yards of earthwork, costing $4,972.50. Also to invite bids for the levee work required at Buckhorn, proposals to build which to be received at the office of the Board of State Engineers, in New Orleans, up to 12 o'clock noon, Wednesday, January 17th, next. This piece of work will be in the nature of an extension to the lower end of the line of levee in your district, so far built, and the extent of the contract will be governed largely by the price per cubic yard at which it may be put under contract, within the limits of the funds now apparently available.

The Board of State Engineers would respectfully call your attention to the fact that new levees will be needed at an early date at Ogden's, Buckhall, Benoit Bayou, Pat. Cash's, Vinson's, and Hall's, besides the extension of the line to the lower limits of the district.

Again, abuses in the nature of travel, road cuts, pathways, fences, hog-rooting, etc, etc., continue to be heaped upon the lines of levee in numerous localities in the district, to such an extent in some places as to greatly impair the security of the levee, and many miles of the line require to be cleared of weeds, young trees, etc., as already set forth in detail in a report to your Board, dated September 27, 1899.

The necessity for regularly and carefully inspecting the levees, and making provision for caring for, maintaining and protecting them, becomes more and more imperative every day, and delay on the part of your Board to recognize and heed this must sooner or later result in disaster to the district.

The Board of State Engineers will at all times, when called upon to do so, be pleased to render you every assistance in its power in performing the duties of your office.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,
Per FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., February 15, 1900.

*Hon. J. W. Jeter, President, Board of Commissioners,*
*Bossier Levee District, Shreveport, La.:*

DEAR SIR—Last week I made a tour of inspection over the greater length of the line of public levee in your district, and beg leave to report for the information of your Board, at the meeting to be held to-morrow, that I found the condition of the line but little changed from that reported to you on September 27th, 1899, and would again refer you to that report for such general information on the subject as you may require in your deliberations.

It is true that *some* improvement has been made at certain points, but at others the condition has been aggravated by abuses from traveling and hauling, during the winter months, and by the rooting of hogs, which, in many places, is now actively going on.

I would state that the contracts for constructing new levees at Dillard's, amounting to about 52,000 cubic yards, and costing about $5,070.00, and at Buckhorn, amounting to about 36,000 cubic yards, and costing about $3,502.80, let out by the State, are well under way, and that the construction of a new levee at Bear Point, amounting to about 70,000 cubic yards, is now under consideration.

Slight changes of bank continue to occur at Ogden's, Buckhall, Benoit Bayou, Cash's, Vinson's and Hall's, which, though not at this date sufficiently serious to immediately require new levees, undoubtedly warrant the conclusion that such will be the case at no distant date, a fact of which your Board should not lose sight.

With reference to the question of repairing the levees, keeping them in repair, inspecting them and enforcing the laws governing their care, preservation and protection, I would respectfully renew the recommendation contained in a letter to you dated January 17th, last, whenever you are prepared to undertake this most important and necessary part of your duties in a systematic and effective way.

I will, however, add that the proposition suggested for the present season by Mr. A. J. Moss, of your Board, namely: to contract with the proprietors of plantations along the line to put the levees along their fronts in good repair, subject to the approval of the local commissioner and State Engineer in charge, appears to me a good substitute for the time being; but I would impress upon you the opinion that in order to insure the work being done properly, and *in season*, it will be necessary to employ a competent inspector at least during the progress of the work, and to specify in your arrangements with the property owners the date for commencing and completing the work, which dates should be within the period of the spring months.

Please advise me as to your conclusions, and any service I can render you.

Yours very respectfully,
F. M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 1, 1898.

*To the Honorable President and Members of the Board of Commissioners, of the Caddo Levee District, Shreveport, La.:*

DEAR SIRS—The Board of State Engineers has the honor to acknowledge the receipt of a letter from the Secretary of your Board, inclosing a copy of a resolution passed by your Board at a meeting held on June 28, 1898, reading as follows: "That the State Board of Engineers be requested to locate a line of levees, commencing at Corner Place and running down Red River to the lower end of the upper levee district."

It has since been explained that the purpose and intent of this resolution is to officially accord to riparian proprietors along that part of Red River, in the Caddo Levee District, over which the system of public levees has not yet been extended, the exemption permitted, under the provisions of Act No. 90, of the General Assembly of the State of Louisiana, session of 1894, in other parts of the district where levees have been built.

Such being the case, the Board of State Engineers would respectfully suggest that if the Board define, by resolution, a location for the levee line that may in part or in whole be eventually constructed, "commencing at Corner Place and running down Red River to the lower end of the upper levee district," it will serve the purpose in view as well as, if not better, than a staked line, the evidences of which would not, as is well known from experience, remain upon the ground for any material length of time, and besides, would, from time to time, be subject to many changes, as caving would develop and occur.

Therefore, the Board of State Engineers would, herein, respect-

fully recommend as a location for a line of levee "commencing at Corner Place and running down Red River to the lower end of the upper levee district," a line which may be described as follows: A line generally two and one-half acres (that is about 500 feet) distant from the river bank, and—within practical limits—generally parallel thereto, subject to such changes of location in the future as may hereafter be deemed necessary.

In this connection, it may be added that the State has already taken into consideration the extension, *down* stream, of the public system above Shreveport along that part of Red River referred to in your resolution, and to this end, and as a beginning, has advertised for proposals to build the "Cairo Levee," bids to be received up to 12 o'clock noon, Wednesday, August 10, 1898.

The work at Cairo this season contemplates improving the levee line from the Corner Place down through Hurricane Bluff and Cairo places, to a point just above Sentell's Ferry Landing, a length of line of about two and one-half miles.

It may also be stated that the project for resuming the extension of the levee line in Caddo parish, *up* stream, from the upper end of the Red Bayou Levee, by the United States, has, within the past ten days, been forwarded by Major J. H. Willard, Corps of Engineers, United States Army, to the Secretary of War, at Washington, D. C., for approval, and that as soon as the approval be returned it is Major Willard's intention to at once advertise the work for construction, the work to be limited this season to a length of about two miles.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,
Per F. M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 26, 1899.

*Hon. E. M. Smith, President, Board of Commissioners,*
*Caddo Levee District, Shreveport, La.:*

DEAR SIR—Between September 14th and 22d instants I made an inspection of the entire line of levee in your district, and believing that a statement of its condition as found, would prove interesting and serviceable to the district, I have the honor to submit the following, prefacing the remarks with the explanation that the section described is compared with that to which the levee was originally built, and that the grade is generally three feet above the highest water known, locally, which, from the State line to the vicinity of the head of Bayou Pierre, was the high water of 1892; from the vicinity of the head of Bayou Pierre to the vicinity of Knox Point, that of 1894; and from the vicinity of Knox Point below, that of 1892 again.

FROM BLANTON'S BLUFF TO SALE AND MURPHY CANAL
(About three miles.)

This stretch of levee was not visited during this inspection, but when last seen in May, the grade, crown and slopes were good, except where disfigured and worn down by pathways and road crossings. The levee was generally clean and well turfed.

FROM SALE AND MURPHY CANAL TO A POINT ABOUT ONE MILE ABOVE HERVEY CANAL.
(About five miles.)

Here a lapse in the levee line occurs, about two miles of which, however, are now under contract for construction by the General Government, and which, when completed, will bring the upper end of this part of your system to a point a short distance above Scott's Slough, and thus reduce the length of the lapse in the line to about three miles.

FROM THE POINT A MILE ABOVE HERVEY CANAL TO RED BAYOU.
(About three and a half miles.)

Grade, crown and slopes full; levee clean and well turfed.

RED BAYOU DIKE.

Grade, crown and slopes good. Land slope of banquette weedy, but otherwise clean and well turfed. Two pathways crossing the embankment.

CAVITT'S.

Grade, crown and slopes good; clean and well turfed.

THOMPSON'S.

Grade, crown and slopes good, except for a short stretch opposite barn, where it has been disfigured and worn down by hogs and stock. One deficient roadway and two pathways. Clean and well turfed. Considerable caving has occurred along the lower part of this place. Only about 150 feet remaining between the centre of the levee and the edge of the river bank for quite a stretch. A new levee will be necessary here at an early date.

FROM THOMPSON'S TO ELMER.
(About three miles).

Grade, crown and slopes good. Clean and well turfed. Log ramp or bridge over levee about 1,500 feet below Thompson's. If permanent it should be ordered removed and an earth ramp substituted. If not, whenever removed, the levee should be carefully examined and any injuries sustained remedied.

ELMER.

Grade and river slope good, but some parts of crown and land slopes badly disfigured and worn in the past by pathways, stock and travel. Most of this, together with all pathways and road crossings, are now being repaired by the district. There are a few bald places on the levee, but otherwise it is generally clean and well turfed.

GARDNER'S.

Grade and river slope good, but crown and land slope has been more or less disfigured in the past by hogs, stock and travel. Most of this, however, being repaired by the district. Except for some few bald spots, the levee is clean and well turfed.

COUSHATTA.

Largely through timber. It should be slashed one hundred feet each side of levee. Grade, crown and slopes good. Some minor repairs have been made at pathways and road crossings. Upper part of line clean, lower part somewhat weedy on river slope, but all fairly well turfed.

DOOLEY BAYOU DIKE.

Grade, crown and slopes good. Land slope weedy, but otherwise clean and well turfed, except along edge of base on river side, where it is being abused and worn by stock using it as a watering place.

DOOLEY BAYOU TO PERU.

Through belt of timber that should be slashed one hundred feet each side of levee. Grade, crown and slopes good. Largely overgrown with big weeds, but mostly well turfed. Log ramp at first angle below dike. If permanent, should be removed and earth ramp substituted. If not, whenever removed, the levee should be carefully examined and all defects remedied.

PERU.

Grade, crown and slopes good. Largely overgrown with weeds, yet generally well turfed. One pathway and one road crossing, recently filled, but not sufficiently so.

EGYPT.

Grade, crown and slopes good. Clean and well turfed. Three road ways, recently filled, but not sufficiently. One pathway along pipe over levee.

WILD LUCIA.

Grade good, but crown and slopes somewhat injured and worn in the early stages of its existence by rain-wash, hogs, stock, road crossings, pathways, etc. The greater part of this wear and tear has recently been restored, but the work done is of an indifferent character. A number of bald spots, but generally clean. There has been considerable caving in the bend below store, but the least bank still measures 250 feet opposite gin house.

CRESCENT.

Grade, crown and slopes good. Somewhat weedy, but generally well turfed. Several pathways and two road crossings recently filled—indifferent work.

CEDAR BLUFF.

Grade, crown and slopes good. From upper line to ferry landing, on lower side of point, levee largely overgrown with small cotton wood,

briar bushes and weeds. Wherever the grass can show up it is well turfed. From ferry landing down to lower line, practically clean and well turfed. Several pathways and two ramps, recently indifferently refilled. Ramps still deficient.

WOOD PLACE.

Grade, crown and slopes good. Clean and well turfed. Three pathways insufficiently filled.

RUSH POINT.

Grade, crown and slopes good. Couple of weedy spots; otherwise all clean and well turfed. Several light pathways and one deficient ramp.

BRIARFIELD.

Grade, crown and slopes good. A few weedy spots; but otherwise clean and well turfed. One bad pathway and two deficient ramps.

ROCKY POINT.

Grade, crown and slopes good. Clean and well turfed; deficient ramp at store.

UNI.

Above Sterling Bayou. Grade, crown and slopes good. Clean and well turfed.

STERLING BAYOU DIKE.

Grade, crown and slopes good. Somewhat weedy, but well turfed. Two dangerous pathways.

UNI.

Below Sterling Bayou. Grade, crown and slopes good. Weedy in places, but generally clean and well turfed. Three bad pathways and two deficient ramps.

HAYTI.

Grade, crown and slopes generally good, but crown and slopes along part of line, from about opposite the residence down to Cottonwood Bayou Dike, disfigured and worn by rain-wash, hog-roots, stock, etc. Clean and well turfed. Several pathways, one deficient ramp.

COTTONWOOD BAYOU DIKE.

Grade, crown and slopes good. Banquette worn by travel. Clean and well turfed. Two bad pathways, one at each end of dike.

WILDERNESS.

Grade, crown and slopes good, except where slightly worn in spots by old rain-wash, hog-roots, etc. Clean and well turfed. Two pathways.

CORNER PLACE.

Upper part of place, grade, crown and slopes good. Clean and well turfed. Lower part, that is, from angle just above gin, grade good and

good section of earth, but crown and slopes somewhat worn by early rain-wash and old hog-roots. Now clean and fairly well turfed. Two pathways and one deficient ramp.

HURRICANE BLUFF.

Grade, crown and slopes good. Greater part of line entirely obscured by heavy growth of weeds and bushes. Where clean and possible to see it, well turfed.

CAIRO PLACE.

Grade good, but crown and slopes somewhat worn and scant in places from rain-wash before turfing. Greater part of line largely overgrown with weeds and bushes; otherwise would be well turfed.

Here the lower end of that part of your system, above Shreveport, at present occurs, though a line of private levee extends somewhat further down through the lower part of the Cairo Place and a part of the Soda Fount Place. From here to Shreveport, however, no levees exist practically, the distance by river being twenty-five miles.

Below Shreveport, your line of public levee again begins, at the foot of the high lands on the west side of Bayou Pierre, and its condition at this time is as follows, viz:

BAYOU PIERRE TO DIXIE.

Recently enlarged to five feet above high water of 1892; crown, 6 feet and slopes 3 and 3 to 1. Grass has not taken well and levee weedy in many places. Should be cleaned off and regrassed.

DIXIE.

Grade, crown and slopes good, but land slope only 2 to 1 for about 1,400 feet at upper end. Weedy in places, but most of line clean and well turfed.

WILCOX.

Grade, crown and slopes good, except for about 1,200 feet, in front of residence, where land slope is deficient and badly worn by old hog-roots and stock. One dangerous pathway. Clean and well turfed.

EAGLE BEND.

Grade, crown and slopes good, but along lower part of place land side only 2 to 1. Weedy in places, but generally clean and well turfed. Two ramps somewhat scant, but not seriously so, and one pathway.

KENTUCKY.

Levee, around crevasse, grade, crown and slopes good, though land side only 2 to 1. Clean and well turfed. Several pathways. Levee, above crevasse, grade good, but crown and slopes scant and ragged as compared with other parts of line. Weedy in places, but fairly well turfed. Several bad pathways. Pit along land side of base should be filled or banquette built.

BAGLEY.

Grade, crown and slopes scant as compared with better parts of line. Slopes also much disfigured and worn in places from old hog-roots, rain-wash, etc. Weedy in places, but generally well turfed. Several pathways, one dangerous, at upper end at junction with Kentucky levee.

CALDWELL POINT.

Grade, crown and slopes good, though land side only 2 to 1. Clean and well turfed. Dangerous road-cut at upper end at junction with Bagley Levee.

RIVERDALE.

Grade, crown and slopes good, though part of line only 2 to 1 on land side. Clean and well turfed. Two pathways, not serious, and one large tree and several limbs of trees lying across levee in belt of timber at upper end of line. The timber through this belt should be slashed for 100 feet each side of levee.

LEVY'S.

Grade, crown and slopes good, though land side only 2 to 1 on some parts of line. Clean, well turfed, except over new levee which is weedy and bald, the grass having mostly been burned out by the drouth. Dangerous pathway opposite house occupied by Abe Harris.

BOYNTON.

Grade, crown and slopes good. Weedy and bald in a few places, but otherwise clean and well turfed.

STATEN POINT.

Grade, crown and slopes good, but river slope somewhat battered in spots, but not materially so, as the section of the embankment is large, and it is all clean and well turfed generally. Crossing at the upper side point should be stopped, or ramp required.

TONES' BAYOU.

Under construction. When completed the grade, crown and slopes will be full, and the entire surface of the embankment planted with living roots of Bermuda grass, not more than one foot apart.

PEACE POINT.

Grade and river slope good, but crown and land slope scant. Clean and well turfed.

LONG BRANCH.

Grade, crown and slopes good. Clean and well turfed. Two deficient ramps.

LONG POINT.

Along upper side of point, grade, crown and slopes are good, though last stretch of new levee near end of point somewhat ragged from rain-wash when first completed. Clean and well turfed. Across

point, grade, crown and slopes good, though land slope somewhat ragged and scant. Fairly clean and well turfed, but bald in spots. Along lower side of point, grade good, but crown and slopes scant as compared with better parts of line. Upper half of this part of the line clean and fairly well turfed, with bald spots here and there. Lower half of this part of the line very weedy. One neglected road-cut.

GAYLE'S.

Grade and river slope good, but crown and land slope scant and ragged. Weedy in spots and scantily turfed. From mule lot to angle of Musser Levee, levee badly disfigured and worn by hogs, travel, crossings, etc.

MUSSER'S.

Upper half, grade, crown and river slope good, but land slope scant in places. Weedy but well turfed. Several bad pathways and one dangerous road crossing at lower end abutting on old river. Lower half, deficient in grade, crown and slopes; obscured by thick growth of weeds.

RUSH BAYOU.

Grade, crown and slopes good. Clean and well turfed. Badly disfigured and worn by crossing at gate opposite residence, and again at gate, lower side of place.

WOODLAWN.

Section generally fair, but weedy and badly disfigured and worn by old hog-roots, pathways, etc.

UPPER BROWN.

Grade, crown, slopes good. Largely overgrown with weeds. Considerable growth young cottonwood in places. Wherever clean, it is well turfed. Disfigured in spots by old hog-roots. Several pathways. One dangerous road crossing in angle just above Waterloo cut-off.

LOWER BROWN.

Grade, crown, slopes good, but scant as compared with upper Brown. Weedy in places, but well turfed. Several pathways, and a few small cottonwood.

PAT. CASH'S.

Grade, crown, slopes good, though part of line only 2 to 1 on the land side. Upper 1,000 feet badly overgrown with weeds and young cottonwood, and weedy in short stretches below. Several bad pathways; one dangerous road crossing opposite residence in front. Section badly disfigured and worn just below gin. No recent change in bank.

PASCAGOULA.

Grade, crown and slopes good, though part of line only 2 to 1 on land side. Practically clean except across point and on spur along upper side of point. Well turfed, though suffering in spots from drouth. Ramp across levee into point should be enlarged.

LOGIE LEA.

Grade, crown, slope good, though upper part of line only 2 to 1 on land side. Upper half practically clean and well turfed. Lower half badly weeded in spots. Land slope on upper half ragged in spots on account of crossings. Angle just below site of old residence badly worn by road crossing. Lower half full grade and section. Sun-cracks bad in places.

WHITEHURST.

Grade, crown, slopes good. Practically clean. Bald in spots and and should be re-grassed. Ramp back of residence deficient.

HUGHES'.

Grade, crown, slopes good, though part of line, on upper side of point, only 2½ and 2½ to 1. Clean and well sodded throughout. Only apparent defect, several pathways, one particularly bad at lower line of place.

CASPIANA.

Grade, crown, slopes good. Practically clean and well turfed. Only apparent defect, usual pathways and insufficient ramps for road crossings.

WHITEHALL.

Grade, crown, slopes good. Weedy in places, but generally clean and well turfed. Only apparent defect, pathway here and there, and two or three deficient ramps or road crossings.

CAMPO BELLO.

Grade, crown, slopes good, though part of line only 2½ and 2½ to 1 Land slope along Dr. Allison's front somewhat ragged and worn. Weedy in places, but generally clean and well turfed. Usual number of pathways and deficient ramps. Caving along levee of 1892 easier. No material change, and good for another high water.

CROSS KEYS.

Grade, crown, slopes good. Generally clean and well turfed, but several dangerous pathways and two dangerous road crossings. One at lane, lower side of point, particularly so. Short stretch below lane badly disfigured and worn by stock.

BAIRD.

Grade, crown, slopes good. Generally clean and well turfed. One dangerous road crossing in lane at upper side of place, and one dangerous pathway back of residence.

BONNER.

Grade, crown, slopes good. Generally clean and well turfed. Dangerous pathway and road crossing in lane at upper side of place, and another just above residence. Section ragged and worn for about 300 feet between lane and residence. Stretch of levee across point in Grand Bend somewhat ragged, worn and bald. Should be repaired to compare with balance of line. Considerable change in bank along upper half of place, but line still safe for quite a while to come.

Respectfully,

F. M. KERR,

*Assistant State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., February 21, 1899.

*Hon. J. G. White, President Board of Commissioners, R. R. A. & B. B. Levee District, Alexandria, La.:*

DEAR SIR—In accordance with your request for an examination of that part of Avoyelles parish, west of the Marksville Prairies, between Red River and Bayou Boeuf, overflowed by rain-water, with the view of considering the ways and means of affording the necessary relief, if possible, the Board of State Engineers would beg leave to report as follows, viz:

Examinations have been made, showing that no permanent interruption to the drainage of the area in question, down to such normal stages as have generally prevailed in the past, exists, but that by the closure of Choctaw Bayou the outlet to the basin has simply been reduced from two to one channel.

This changed condition demands a greater length of time than formerly for affording the usual relief, not only because of the reduction of the number of outlets, but because the capacity of the remaining one (Bayou du Lac), in its present condition, is, in its relation to the particular basin in question, less efficient than that which emptied into Red River, when the stages of the latter permitted the discharge that way.

Bayou du Lac is, however, a natural outlet of the basin, and *is* affording relief, comparatively slowly, it is true, but steadily and continuously, and its ability to perform better work in that direction, as compared with the past, need only be limited by the amount of improvement in the way of removing trees, stumps, brush, fallen timber and debris from the channel, and excavation that you may be able to apply to certain portions of the stream.

Other routes were considered and partly examined, but while they appear to present solutions to the problem, the evident great expense involved in making them effective must, for some time to come, offer almost insurmountable difficulties to your district.

A popular belief exists around Marksville that the depression and partly abraded waterway across the Marksville Prairies, known as the Coulee des Grues, could be made to render effective service as an outlet to the rain-water in question, by cutting a ditch or canal throught it.

That the Coulee des Grues would, at times, if so treated, rapidly carry off a considerable part of this water is true, but in adapting it to this service, it would, in times of extreme floods in the Red and Mississippi rivers, also open up a new inlet to the latter, which would reach a stage in the swamps only something like six feet lower than that which existed when Choctaw Bayou was open. It does not seem probable either that the relief from rain-water, which it might in season afford, would be equal to that rendered by Choctaw Bayou itself originally.

Two sources of dissatisfaction must, therefore, eventually arise from opening up this coulee, namely, the occasional inconvenience, if not damage, from high waters, to the section of country above which it must at certain times admit, and its failure to do all that it is popularly believed it is capable of accomplishing.

The work involved, however, is not of any great magnitude, and if your Board, in the light of its restricted means, believed that it could afford, as a temporary measure, and an auxiliary to the Bayou du Lac channel, to expend the sum required for the work, knowing that the probabilities are that demands will, at some later period, be made upon you to close and abandon it, the Board of State Engineers would not withhold its approval. The number of cubic yards of excavation for a canal to accomplish fair results would probably not exceed 75,000, and might be done for ten cents per cubic yard.

It is the belief of this Board, however, that, while it might not prove entirely satisfactory to all of the interests involved, a condition of affairs practically as good as that which existed previous to the closure of the Choctaw Bayou, can be restored by simply improving Bayou du Lac alone, and would recommend that your first efforts be directed to that work, leaving the question of the canal through Coulee des Grues in abeyance, or to the public spirit and liberality of the property holders and others interested in utilizing it.

The improvement of Bayou du Lac, herein referred to, might be made at a cost not exceeding $10,000.00, if prosecuted at a favorable season of the year.

Whenever your Board is ready to undertake the work here recommended, please advise us, and we will promptly prepare and forward to you all the necessary plans and specifications.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,
Per FRANK M. KERR,
*Assistant State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 20, 1899.

*Hon. J. G. White, President Board of Commissioners, Red River, Atchafalaya and Bayou Bœuf Levee District, Alexandria, La.:*

DEAR SIR—The Board of State Engineers has thought it might be useful to you to present, at this meeting, a brief statement in regard to the condition of the levees in your district, and their immediate requirements.

On Bayou Rapides your line of levee has, from time to time, since the organization of your district, been greatly improved, but it is still far from being in as thorough a condition as its location, at the head of the district, demands. To thus improve it will involve payment for about 75,000 cubic yards.

On Red River no part of your levee line, except the Alexandria front, is less than three feet above the highest known water, with good crown and section. Some parts of it, however, are deficient in slope, and should be improved in that respect. This could be done with less than 100,000 cubic yards.

On Bayou des Glaizes less than fifty per cent. of the line has, so far, been sufficiently improved, and in several localities the necessity for this improvement is urgent, namely: from Gray's to Bordelonville, Havard's, Mill Bayou, Howard's, Wayside and Yellow Bayou to Simsport, amounting to about 250,000 cubic yards.

On the Atchafalaya River the greater part of the line consists of improved levee, but the high water of 1897 demonstrated that its grade was insufficient, as may be judged by the following figures:

Only about one mile is three feet above the high water of 1897; as much as twenty-four miles is less than three; as much as fourteen miles is less than two feet, and as much as two miles is less than one foot above the high water of 1897.

To improve the grade of this line of levee three feet above 1897, and give it a corresponding adequate cross-section will involve not less than 500,000 cubic yards.

This is probably beyond your immediate means, and your attention is, therefore, at this date, only directed particularly to the following localities on the Atchafalaya urgently requiring early treatment, namely, at Green's Store, Bayou Current and Kay's, involving payment for about 75,000 cubic yards.

The necessity for considerable work in the way of minor repairs, redressing, sodding and draining, exists in certain localities throughout your district. This is a character of work, however, which can best be done under competent foremen, or inspectors, employed by the district, and no estimate can well be placed upon it. Its cost, however, should be inconsiderable.

Your Board cannot be said to have so far more than kept pace annually with the immediate needs of the district as then presented, and it has yet to face a large amount of additional work in the way of enlargement and extension, not to speak of drainage. An evidence of the latter fact is presented to you at this meeting, when you are inviting proposals to improve drainage through Bayou du Lac.

The Board of State Engineers hopes that your Board will not lose sight of the magnitude of the work thus shown to still devolve upon you, and that you will continue to devote your best energies to provide means to bring the line throughout the district up to the standard demanded, as rapidly as possible.

Respectfully,

THE BOARD OF STATE ENGINEERS,

Per F. M. KERR,

*Assistant State Engineer.*

# APPENDIX E.

**Copies of Sundry Special Reports to the Governor, Letters addressed to the Mississippi River Commission, etc., and of Resolutions relative to Improvement of Bayou Lafourche.**

# APPENDIX E.

## SPECIAL REPORT TO GOVERNOR RELATIVE TO CREVASSES, ETC., IN 1897.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 28th, 1898.

*To His Excellency, Murphy J. Foster, Governor of Louisiana, Baton Rouge, La.:*

SIR—In compliance with your request, through Assistant State Engineer Thompson, for certain items of information relative to the crevasses of 1897, we respectfully submit the following:

There were fourteen breaks reported as crevasses in the levees of the corporate Levee Districts in the State during the flood of 1897, four of which were closed within a few hours, or at most days, of their occurrence. There were also four breaks in the town of Baton Rouge which were very promptly closed, and also several others, not closed, in the levees below the Lake Borgne Basin Levee District.

The aggregate width of the fourteen crevasses in the Levee Districts was about one mile and three quarters, and the loss of levees themselves, amounted to about 90,000 cubic yards of earthwork.

The total area of submerged territory in the State during the flood has been estimated at about 1,425,000 acres, of which only about 100,000 acres was cultivated land.

We have no estimate of damage caused by overflow. Fences were carried away, and ditches were filled, and in many cases crops had to be replanted; but there was little loss of stock and no loss of life, while in consequence of the favorable season the crops raised on overflowed land are generally reported to have been as good as those on the lands not overflowed.

The total amount of earthwork for replacing the levees destroyed by the crevasses of 1897 amounts to about 583,000 cubic yards, or the construction of about three and a half miles of new levee of higher grade and stronger section than the levees they replace.

The highest water during the flood of 1897 at a number of points, as compared with the highest of previous years, is given under the head of "High Water and Crevasses," p. 18, of the report of April 20th, recently submitted; and we enclose herewith two blue print tables, from which comparisons for a number of other points and years can be made. "Ap-

pendix D" of the report is now in the hands of the printer, and we have no copy in the office. It consists of twenty-six pages of figures, which would require some time for copying, and we trust the accompanying tables may serve your immediate purpose.

Very respectfully,

THE BOARD OF STATE ENGINEERS,
PER HENRY B. RICHARDSON,
*Chief State Engineer.*

---

REMARKS BEFORE THE MISSISSIPPI RIVER COMMISSION AT ITS MEETING IN NEW YORK, JUNE 17, 1898, BY HENRY B. RICHARDSON, OF LOUISIANA, CHIEF STATE ENGINEER.

GENTLEMEN—The remarkable success you have already achieved in controlling the floods of the Mississippi river by means of levees, leads to the hope and belief that you will continue to allot, each year, from the funds at your disposal, at least as large a sum as you have at any time applied to the improvement of levees heretofore. Should you find it possible to allot from the appropriations by Congress for continuing the improvement of the Mississippi River as much as was allotted last year, or say, one and a half to one and three-quarters million dollars, for the year ending June 30th, 1899, you will go far towards averting the danger of destructive overflow which still threatens, at least, some parts of the alluvial valley, and towards assuring the final success of the levee system, which your wisdom and courage has largely created, and to the completion of which the nation, by the effective aid already supplied by Congress, stands morally pledged.

It is understood that you have already made projects for levee improvement expected to involve about $700,000 of the funds of the fiscal year 1898-1899, and assuming that it may come within your means to allot a further sum of about a million dollars from the same fund for this purpose, I wish, in the interest of the State of Louisiana, to suggest a few matters which I hope may receive consideration in fixing the details of any allotment you may make for levee improvement.

1. That there is a stretch of some seventy-five miles of river divided about equally above and below the Arkansas-Louisiana line, in which the flood of the present year reached nearly the same height and in some places a little greater height than that of the great flood of last year, 1897, and that within this stretch there are considerable lengths of levee which were only kept above water this season, as well as last, by the work done on them with sacks, planks and temporary capping while the flood was passing. It is estimated that within this stretch of about seventy-five miles there is required in Louisiana alone about 900,000 cubic yards of earthwork to enlarge the existing line to a grade three feet above the high water of 1897 and 1898, while still below in the same

district (that is, above Warrenton) as much more is needed to put the levees three feet above the high water of 1897. The flood of 1898, except in the stretch of river above referred to, was nowhere in Louisiana nor anywhere south of the Arkansas River, as high as that of 1897, and this fact suggests that this region of excessive high water should have more ample provision made for the improvement of its levees than localities where the flood was not so high.

2. A bill is now pending (or, perhaps, has already passed) in the legislature of Louisiana incorporating a new levee district, to be called the Grand Prairie Levee District, and extending from the lower limit of the Lake Borgne Basin Levee District to Fort St. Philip. It is to be organized on the same plan as the other levee districts of Louisiana. A preliminary estimate of the earthwork required to build and enlarge the twenty-three miles or so of levee required along the river amounts to upwards of 700,000 cubic yards. It is, therefore, suggested that the territory or front of this new levee district be specifically included within the limits of the U. S. Lake Borgne District, and that the funds allotted for levee improvement in the Lake Borgne District be made sufficient to permit giving to the Grand Prairie Levee District such assistance as has been supplied to other organized levee districts.

3. With a view to securing the earlier improvement of greater lengths of line, with the means available, it is respectfully suggested that for the present, or until the improvement of the levee has been brought to some degree of uniformity in grade and section—at least above the mouth of Red River—that the grades be generally limited to, say, three feet above the highest previous water in the river. This, I believe, is about the grade to which the levee works of the United States in Arkansas and in Louisiana, above opposite Warrenton has been built, and is the general grade to which the levee work of the State and the Levee District of Louisiana has been built everywhere above the head of Bayou Lafourche. Much higher grades will doubtless be called for in the future; but if a hundred miles of line could be improved to uniform grades three of four feet above high water, with the same means as is required to improve fifty miles to grades still higher by two or three feet, leaving the remaining fifty miles with little or no margin above high water, it would, I submit, appear good policy in most cases to undertake improving the one hundred miles instead of the fifty miles only.

4. After the many years since 1882, when your executive officers found it necessary for lack of funds to withdraw the advertisement for proposals to build the Bougere Crevasse Levee, during which time the necessary means for work on the unleveed front of twenty-six miles below Bougere Landing has never been in sight, except by faith in the possibilities of the future, it is, perhaps, hardly worth while to mention the fact that this great crevasse, the only one left of the "outlets" inherited by the Commission, still remains an open mouth, through which the voice of the people who live within its influence and are almost annually overflowed from it, cries aloud for protection. If means cannot

be found for undertaking the entire work, it has been suggested that a part of it might be done each season for a series of years, which would present the advantage of closing this ancient outlet gradually, as well as give the people behind it some hope that relief may finally come to them.

5. Another matter of importance in its bearing upon levee interests of Louisiana is the construction and preservation of certain bank revetments. The revetment above Lake Providence is understood to be in good condition and has thus far admirably served its purpose, and avoided the necessity for constructing many miles of new levee, which, without it, would have been required before this time. But the revetment at Delta Point, or rather in the bend just above that point, has evidently become disintegrated and lost its efficiency, so that, unless soon repaired or restored, there appears strong probability that the work on the point itself may be flanked and also destroyed. The caving bank in the bend already threatens the existing levee line, and unless the erosion is checked at an early date, new and costly levee locations appear inevitable. The revetment work at Delta is among the earliest works of bank protection undertaken on the lower river, and it has stood for nearly twenty years a monument to the efficiency and success of this class of work. To lose or neglect it, and give up holding Delta Point, would mean to a great number of people who have pointed to it as a conspicuous example of what it is possible to do in the way of bank protection, far more than the mere loss of the adjacent levees, of the railway crossing, and of the harbor of Vicksburg, which would follow as a consequence of its loss. It would mean a loss of confidence in the possibility of holding the banks at all.

The river bank around the Kempe Bend has continued to cave more or less rapidly, but never ceasing for more than thirty years, and the cost of levees, built one after another around this bend, as they were encroached upon by the caving bank, has been largely over a million dollars, and I think nearer two million dollars. The existing levee, built by the United States, is a large and costly work on good foundation, and probably could not be replaced with less than a million cubic yards of earthwork; while from the nature of the ground back of it, it is probable that difficulties would be met in construction and doubts developed as to the security of foundations. At the present rate of caving but a few (perhaps not more than one or two) years can elapse before a new levee location will become necessary.

It has been suggested that the revetment of a mile or a mile and a half of the bank in this bend may be done for less than a hundred thousand dollars. If this is the case, there can be no doubt, I presume, that more than double that sum would be ultimately saved in levee construction.

The revetment work, proposed in New Orleans harbor has an important bearing, I think, upon the levee interests of Louisiana, beyond and outside of the local levees in that city which may be immediately

affected by the work. The laws and jurisprudence of Louisiana have become settled, and accepted as to the right of the public to enter upon and use private property for levee purposes without money compensation to the owners. Without this right a large part of the public funds raised for levee works must have gone to pay for rights of way and for damages, as is unfortunately the case in other States to-day. This would have greatly hampered and restricted the progress of levee protection, and it is generally felt by thinking men, in the rural districts, at least, that any change, by which money compensation to private owners is required, will be ruinous to the levee interests.

But in the city of New Orleans, by reason of the large number of small properties damaged or occupied whenever it becomes necessary on account of caving bank to retire the levee line, there has lately developed a strong sentiment in favor of such public compensation of private parties, and the legislature has given the Orleans Levee Board certain special powers in that direction. Should these ideas become prevalent in the country districts I believe the result would be disastrous, and for this reason, as well as for the merits of the work itself, I beg to suggest the importance of hastening the work of holding and fixing the banks of the river in the city of New Orleans, so as to prevent as far as possible all further loss of levee lines with the consequent demand for compensation.

As regards the details of your allotments for levees, I feel assured you have such information from your district officers and their assistants as will enable you to judge better than I can of the relative needs of the several districts, and I will not trouble you with further suggestions on the subject.

---

SPECIAL REPORT TO THE GOVERNOR RELATIVE TO MEETING OF MISSISSIPPI RIVER COMMISSION.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 25, 1898.

*To His Excellency, Murphy J. Foster, Governor of Louisiana:*

SIR—As directed by your letter of June 9th, I attended the recent meeting of the Mississippi River Commission in New York, returning here on Thursday.

The session of the Commission began on Wednesday, June 16th, and continued throughout the remainder of the week. They were mostly occupied with executive matters until Friday, 19th, when audience was given to the public. The United States Engineer Officers in charge of work, with several of their assistants, and the Engineers of the Levee Districts of Mississippi, Arkansas and Missouri were present, with other officials and parties interested in levee work and in other matters of river improvement. Mr. Maxwell, President of the Fifth Louisiana Levee District, and myself, I believe, were the only persons present from Louisiana, except the U. S. Assistant Engineers.

Senator Berry and Congressman McRea, of Arkansas, as also Congressman Catchings, of Mississippi, addressed the Commission, and others made brief remarks, filed sundry statistical papers and responded to questions.

Referring to the fact that the high water of this year was equal to, or even higher than that of 1897, for a considerable distance above and below the Arkansas-Louisiana line, I suggested that this portion of the levee line merited special consideration in the allotment of funds for levee work. I also called attention to the fact that the high grades to which a considerable part of the levee work of the United States was being built in some portions of the State, only resulted in leaving greater lengths of levee line at dangerously low grades than would be the case if the grades were somewhat reduced; and urged that for the present the work be spread out thinner, so as to cover more of the existing low levees at an earlier date and with the same money.

I also mentioned the probable incorporation of the new "Grand Prairie Levee District," and suggested that allotments be so made that this district, if formed, might share in allotments.

I further spoke of the importance to the levee interests of Louisiana of certain bank revetments, notably that proposed in New Orleans harbor, etc.

The allotments of funds for levee work out of the $1,983,333.00 carried in the Sundry Civil Appropriation Bill, now pending in Congress for the improvement of the Mississippi River, amount to $1,075,000.00. Of this amount, $700,000.00 had been allotted at a meeting in February last, leaving $375,000.00 additionally allotted at this meeting

The details of allotment, I understand, are as follows:

| DISTRICT. | Allotment of February, 1898. | Allotment of June, 1898. | TOTAL. |
|---|---|---|---|
| St. Francis, Arkansas..... | ..... | $ 34,000 00 | $ 34,000 00 |
| White River, Arkansas..... | ..... | 30,000 00 | 30,000 00 |
| Upper Yazoo, Mississippi.... | $20,000 00 | 26,000 00 | 46,000 00 |
| Lower Yazoo, Mississippi..... | 260,000 00 | 90,000 00 | 350,000 00 |
| Upper Tensas, La. and Ark. | 115,000 00 | 100,000 00 | 215,000 00 |
| Lower Tensas, La..... | 120,000 00 | 30,000 00 | 150,000 00 |
| Atchafalaya, La..... ..... | 70,000 00 | 17,000 00 | 87,000 00 |
| Pontchartrain, La..... | 60,000 00 | 16,000 00 | 76,000 00 |
| Lafourche, La..... | 24,000 00 | 12,000 00 | 36,000 00 |
| Barataria, La..... | 15,000 00 | 12,000 00 | 27,000 00 |
| Lake Borgne, La..... | 16,000 00 | 8,000 00 | 24,000 00 |
| Total..... | $700,000 00 | $375,000 00 | $1,075,000 00 |

This shows over 54 per cent. of the total appropriation for the fiscal year 1898-9, allotted to levee work, and over 57 per cent. of this amount (or $615,000.00) allotted to levee work in Louisiana and that part of Arkansas in which we are equally interested.

The commission also practically limited the grades of levee work for the present (except in special cases) to not exceeding three feet above highest water marks, which will permit the present allotments to cover

the raising of a much greater length of levee line in some parts of the State than would have been possible with the same means had the higher grades been maintained. They also increased the allotment for the Algiers revetment work in New Orleans harbor, to about $100,000.00, I believe, and expect to have it done this season.

Considering the smaller amount carried this year than last in the appropriation bill for river improvement, I think we have no reason to complain that the levee interests have been slighted by the Commission, and that Louisiana has received a just and reasonable share of the allotments.

Very respectfully,

HENRY B. RICHARDSON,
*Chief State Engineer.*

---

LETTER TO PRESIDENT MISSISSIPPI RIVER COMMISSION RELATIVE TO CAVING BANKS, LEVEES AND REVETMENT IN KEMPE BEND.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 3d, 1898.

*Gen. G. L. Gillespie, Corps of Engineers, U. S. Army, President Mississippi River Commission, Army Building, New York, N. Y.:*

DEAR SIR—The Kempe Bend of the Mississippi River (656 to 660 miles below Cairo, right bank) has been caving for more than thirty years. The caving continues and has recently breached the large and costly levee line, built by the United States in 1887-88, so that a new line of levee to cover the breach, has just been put under contract. The recession of the river bank, opposite this proposed new piece of levee, has been fully a mile and three-quarters since 1866, or an average of nearly 300 feet per year. I understand the new line to be designed only with a view to temporary protection, and presume it can hardly be expected to serve its purpose for more than two high water seasons, even if that long. Or, should the new line prove more enduring, it is probable, I suppose, that the caving may encroach upon other parts of the existing levee within two years from this time.

The completion, before the usual high water season, of any levee line of much greater permanency than that now undertaken, would evidently be impracticable; but the emergency which has developed the necessity for this temporary expedient, only makes it more evident that early attention must be given to the Kempe Bend, and that projects must be soon prepared either for the revetment of the bank or for the building of a new line of levee to cover the front now threatened.

The existing levee line traverses a low, wooded swamp, with numerous sloughs and undrained flats, and the country for a considerable distance in the rear presents similar features that must make the construction of a new levee there costly and perhaps difficult. I imagine any line there will not be less than four miles in length, and will pro-

bably require as much as a million cubic yards of earthwork, which is likely to cost upwards of $200,000.00. Possibly a location may be found on higher ground generally beyond the limits of the low swamp; but any such line would be much longer and probably not less in cost, though as regards permanence and ease of construction, it might be preferable.

If a work of any such magnitude is to be undertaken it should be started as early as possible, as it is hardly to be expected that it could be begun and finished in a single season. It is more than likely that such a work would require two years for its completion, and it does not seem probable that the existing line will last longer than that, if, indeed, so long.

The undertaking of any such extensive work by the local Levee District or by the State, seems to me out of the question at this time. They are unable to provide sufficient means, and if the work is left to them the result will almost certainly be that such means as they can supply for it will be frittered away year after year in temporary expedients and attempts at patching up the breaches as they occur.

If a mile or so of the river bank could be revetted within another year, it appears probable that it would save the existing levee back of the revetment, and if the caving still continued below the revetment there would be time to extend it further down stream before the caving could encroach upon the levees.

Of course, the practicability, cost, and relative advantages of any projects for new levees, or of alternatives in the way of bank revetment, can only be determined from explorations and detailed surveys; and my only object in writing at this time is to emphasize the importance of immediate attention to the situation, and to request that you bring the matter to the attention of the Commission, or take such steps as in your judgment may be requisite to have it studied and considered at an early date so that any work which may be determined upon can be promptly begun and expeditiously completed.

Very respectfully,

HENRY B. RICHARDSON,
*Chief State Engineer, La.*

---

REMARKS BEFORE THE MISSISSIPPI RIVER COMMISSION AT ITS MEETING IN NEW YORK, MARCH 8TH, 1899, BY HENRY B. RICHARDSON, OF LOUISIANA, CHIEF STATE ENGINEER.

GENTLEMEN—The Governor of Louisiana has directed me to be in attendance upon your meeting at this time " with a view to presenting and obtaining such information as may be available in the interest of Louisiana, or as may aid us in co-operating with the United States in the improvement of the Mississippi River."

The State of Louisiana is deeply interested in all the work with which the Commission is charged, whether designed to give permanency to the river's banks, to deepen its channel for the ease and safety of

navigation, or to prevent destructive floods; and whether it is carried on within the limits of the State or elsewhere.

But that branch of the river improvement you have in hand, with which my State is most immediately concerned, and in which it is authorized by its laws and required by public sentiment to co-operate, is the construction and protection of a system of levees that will prevent destructive floods.

I have been permitted to see some of the results of recent estimates, made under your direction, of the additional earthwork required in the several levee districts to raise and enlarge existing levees to the standard grade approved by you in June last; and am gratified to find that they practically confirm the conclusions of the Louisiana Board of State Engineers as to the condition of their Mississippi River levee system. Nearly sixty per cent. of the total contents required on existing lines of levee in Louisiana, when completed to the approved grade, appears to be already in position; and substantially the same proportion of material is in place on the existing lines in Mississippi and Arkansas. Variations from the average ratio of work done to total work required, do not amount to as much as nine per cent. in any of the levee districts. This uniformity of condition must be recognized, I think, by all right-minded people as an evidence of the care, good judgment and impartiality with which the allotment of funds at the disposal of the Commission has been made among the several districts. There can be no doubt that this striking uniformity of condition is largely the result of these allotments.

Your estimates of the amount of work remaining to be done in the several districts to complete the levees to the approved standard of grade and section, I presume, may furnish a basis for the proper distribution of funds to be allotted for the further improvement of levees; but I also presume the quantity of new levee work that may become necessary in the near future on account of caving banks, and perhaps the extension of existing lines to cover portions of the river bank now practically unleveed, will have consideration in determining the details of such allotments.

I am not informed as to the extent to which new levee work required for these purposes is included in your estimates; but as it appears to form a large item in some of the districts in Louisiana, the Board of State Engineers has endeavored to prepare estimates, based upon the local knowledge and judgment of its members, of the probable amount of new levee that may be required in the several districts in Louisiana, on account of caving banks, within the next two years.

These estimates sum up in cubic yards as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| U. S. Upper Tensas District | (in | Louisiana). | ..... | 3,075,200 | cubic | yards. |
| U. S. Lower Tensas | " | " | " | ..... | 5,394,100 | " | " |
| U. S. Atchafalaya | " | " | " | ..... | 2,052,800 | " | " |
| U. S. Lafourche | " | " | " | ..... | 1,171,200 | " | " |
| U. S. Barataria | " | " | " | ..... | 290,500 | " | " |
| U. S. Pontchartrain | " | " | " | ..... | 534,000 | " | " |
| U. S. Lake Borgne | " | " | " | ..... | 341,400 | " | " |
| | | | Total..... | 12,859,200 | cubic | yards. |

Of the foregoing amounts it is considered probable that the following will berequired within one year:

| | | | |
|---|---|---|---|
| Upper Tensas District | ..... | 2,206,200 | cubic yards. |
| Lower Tensas " | ..... | 4,596,800 | " " |
| Atchafalaya " | ..... | 1,201,900 | " " |
| Lafourche " | ..... | 665,900 | " " |
| Barataria " | ..... | 234,200 | " " |
| Pontchartrain " | ..... | 148,000 | " " |
| Lake Borgne " | ..... | 278,000 | " " |
| Total | ..... | 9,331,000 | cubic yards. |

The amounts above given for the Lower Tensas District include 2,178,800 cubic yards for a new levee to close the gap known as Bougere Crevasse; which opening, although among the first advertised to be closed by the levee work undertaken by the United States in 1882, still remains unleveed. Its closures, besides reducing the area subject to overflow in the lower end of the Tensas Basin, should tend to keep a more continuous current in one direction through Old River, and thus probably to the betterment of its channel.

These estimates also include works at several points where it has been suggested that bank revetment may be undertaken at an early date; in which case, new levees may be either unnecessary, or at any rate, might be greatly reduced in length. The points referred to are as follows: In the Upper Tensas District, "Longwood and Elton," 535 miles below Cairo, and "Delta," 597 miles below Cairo, the former estimated at 760,200 cubic yards, and the latter at 179,000 cubic yards; in the Lower Tensas District, "Kempe," 657 miles below Cairo, estimated at 1,593,000 cubic yards; and in the "Atchafalaya District," "Torras," 765 miles below Cairo, estimated at 144,300 cubic yards.

It seems probable that the caving bank now threatening the levees at the points above mentioned might be sufficiently covered by about 8,000 linear feet of revetment at Longwood and Elton, about 5,000 feet at Delta, about 30,000 feet at Kempe, and about 3,500 feet at Torras; but, apparently, an extension of the existing revetment above Lake Providence about 4,000 feet up stream would, for the present, save the most important part of the levee now threatened at Longwood and Elton, and about 10,000 feet might be sufficient at Kempe, if put in during the present season, to prevent the loss of levee line now most immediately threatened.

It is earnestly hoped that you may find it possible to build revetments at these points this season, and believed that by so doing you may save at least $600,000 worth of levee building, which must otherwise be undertaken at an early date.

Our people confidently rely upon your knowledge and judgment to make equitable allotments from the funds placed at your disposal for the maintenance and improvement of levees; and on their part, I feel authorized to assure you that the State and its several levee districts will continue, as heretofore, to use all the resources at their command for the same purpose.

I shall be glad to receive as early information as may be regarding your conclusions in these matters, in order that we may be prepared to intelligently co-operate to the best of our ability.

---

SPECIAL REPORT TO THE GOVERNOR RELATIVE TO MEETING OF MISSISSIPPI RIVER COMMISSION.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 16th, 1899.

*To His Excellency, Murphy J. Foster, Governor of Louisiana, Baton Rouge, La.:*

SIR—Pursuant to instructions contained in your letter of March 2d, I appeared before the Mississippi River Commission at its recent meeting in New York.

They were addressed by several Senators and members of Congress, and by the engineers and representatives of a number of the levee districts of Arkansas and Mississippi.

I enclose, herewith, for your information a copy of the remarks I was permitted to address them, which were accompanied by details in tabular form, showing the estimates as prepared in this office of the quantity of new levee work considered as likely to become necessary within the next two years on the Mississippi River, in the several levee districts in Louisiana, on account of threatened caving of river banks.

The appropriations for the improvement of the Mississippi River, under the plans of the Commission, carried in the Sundry Civil Bill, amounted to $2,583,333. Of this sum they allotted $1,250,000 for levees; about fifty-four per cent. of which, or $674,250, was for work in Louisiana and that part of Arkansas in which we are equally interested.

Besides this, they allotted $205,000 for bank revetment in Louisiana (at Kempe Bend and above Lake Providence), which, it is hoped. may save a large part of the existing levee lines at the points named from threatened encroachment of the caving river banks.

The River and Harbor Bill carried appropriations for work to be executed, under the plans of the Commission, at New Orleans harbor, for the rectification of Red and Atchafalaya rivers, and for Natchez and Vidalia harbors, amounting to $185,000, in all of which work Louisiana is specially interested.

I think we have reason to be well satisfied with the action of the Commission, and that Louisiana has been fairly and justly considered in the allotment of funds at their disposal.

Very respectfully,

HENRY B. RICHARDSON,
*Chief State Engineer.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 20, 1900.

# STATEMENT

Prepared by request for the information of the Mississippi River Commission, showing quantity and cost of levee work done by the State of Louisiana and its several District Levee Boards, on the Mississippi River, from April 20, 1882, to April 20, 1900, by periods of two years, in each of the United States Levee Districts.

NOTE.—These tables do not include the large and mostly unrecorded amount of work done on public levees in Louisiana by parochial and municipal authorities, by corporations and private parties, and do not include any expenses of administration or discount or interest paid by the several levee districts on bonds or other debts. They are also exclusive of most of the wooden revetments and other protective works, and of high water expenses, such as sacks, lumber, freight, guards, laborers, etc.

## (1) FROM APRIL 20, 1882, TO APRIL 20, 1892.

| Name of United States Levee Districts | 1882 to 1884 | | 1884 to 1886 | | 1886 to 1888 | | 1888 to 1890 | | 1890 to 1892 | | Totals, 1882 to 1892 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost |
| Upper Tensas.. | 668,649 | $161,170 90 | 598,644 | $146,201 69 | 1,844,953 | $413,454 36 | 2,396,248 | $402,460 17 | 1,753,211 | $403,087 86 | 7,261,705 | a $1,526,374 98 |
| Lower Tensas.. | 376,567 | 93,805 69 | 289,077 | 64,488 69 | 1,132,770 | 298,968 66 | 319,468 | 54,796 62 | 635,425 | 114,002 51 | 2,753,307 | 626,062 17 |
| Atchafalaya Basin.. | 563,131 | 146,952 06 | 577,182 | 125,658 67 | 712,630 | 151,655 34 | 1,513,368 | 233,835 58 | 3,226,319 | 749,359 95 | 6,592,630 | 1,407,461 60 |
| Lafourche ..... | 315,723 | 70,425 02 | 406,767 | 84,539 34 | 368,736 | 58,644 90 | 524,192 | 75,914 68 | 616,931 | 116,724 73 | 2,232,349 | 406,248 67 |
| Barataria..... | 128,418 | 31.212 20 | 64,288 | 11,298 27 | 129,532 | 18,925 60 | 166,620 | 24,225 79 | 591,005 | 100,918 70 | 1,079,863 | b 186,580 56 |
| Pontchartrain.. | 609,197 | 159,548 04 | 437,374 | 88,578 60 | 544,884 | 85,702 40 | 706,992 | 102,325 74 | 1,269,739 | 245,410 20 | 3,568,186 | 681,564 98 |
| Lake Borgne... | 139,934 | 30,374 85 | 57,153 | 9,522 34 | 50,540 | 6,819 54 | 253,706 | 34,702 96 | 876,945 | 160,033 07 | 1,378,278 | c 241,452 76 |
| Totals..... | 2,801,619 | $693,488 76 | 2,430,485 | $530,287 60 | 4,784,045 | $1,034,170 80 | 5,880,594 | $928,261 54 | 8,969,575 | $1,889,537 02 | 24,866,318 | $5,075,745 72 |

(2) FROM APRIL 20, 1892, TO APRIL 20, 1900.

| Name of United States Levee Districts | 1892 to 1894 | | 1894 to 1896 | | 1896 to 1898 | | 1898 to 1900 | | Totals, 1892 to 1900 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost |
| Upper Tensas | 2,150,850 | $378,338 56 | 567,024 | $76,860 35 | 253,909 | $43,150 79 | 1,757,014 | $289,414 12 | 4,728,797 | d $787,763 82 |
| Lower Tensas | 119,607 | 24,929 16 | 789,374 | 108,925 56 | 1,667,561 | 241,354 81 | 504,246 | 101,396 45 | 3,080,788 | 476,605 98 |
| Atchafalaya Basin | 1,199,913 | 220,585 34 | 518,215 | 68,407 65 | 1,868,205 | 250,942 96 | 1,694,441 | 285,670 81 | 5,280,774 | 825,606 76 |
| Lafourche | 1,789,489 | 281,250 27 | 21,542 | 2,195 20 | 449,085 | 74,560 48 | 473,292 | 71,971 89 | 2,733,408 | 429,977 84 |
| Barataria | 398,041 | 80,454 96 | 112,334 | 16,359 84 | 492,114 | 91,218 15 | 116,791 | 17,941 83 | 1,119,280 | e 205,974 78 |
| Pontchartrain | 1,594,582 | 444,656 86 | 207,841 | 41,650 39 | 299,069 | 49,382 10 | 252,284 | 51,662 24 | 2,443,776 | 587,351 59 |
| Lake Borgne | 520,001 | 87,948 77 | 137,216 | 22,071 82 | 379,554 | 67,193 37 | 377,123 | 54,635 94 | 1,413,894 | f 231,849 90 |
| Totals | 7,772,483 | $1,518,163 92 | 2,443,546 | $336,470 81 | 5,409,497 | $817,802 66 | 5,175,191 | $872,693 28 | 20,800,717 | $3,545,130 67 |

(3) RECAPITULATION FROM APRIL 20, 1882, TO APRIL 20, 1900.

| NAME OF UNITED STATES LEVEE DISTRICTS | 1882 to 1892 | | 1892 to 1900 | | Totals, 1882 to 1900 | |
|---|---|---|---|---|---|---|
| | Cubic Yards | Cost | Cubic Yards | Cost | Cubic Yards | Cost |
| Upper Tensas | 7,261,705 | $1,526,374 98 | 4,728,797 | $787,763 82 | 11,990,502 | g $2,314,138 80 |
| Lower Tensas | 2,753,307 | 626,062 17 | 3,080,788 | 476,605 98 | 5,834,095 | 1,102,668 15 |
| Atchafalaya Basin | 6,592,630 | 1,407,461 60 | 5,280,774 | 825,606 76 | 11,873,404 | 2,233,068 36 |
| Lafourche | 2,232,340 | 406,248 67 | 2,733,408 | 429,977 84 | 4,965,748 | 836,226 51 |
| Barataria | 1,079,863 | 186,580 56 | 1,119,280 | 205,974 78 | 2,199,143 | h 392,555 34 |
| Pontchartrain | 3,568,186 | 681,564 98 | 2,443,776 | 587,351 59 | 6,011,962 | 1,268,916 57 |
| Lake Borgne | 1,378,278 | 241,452 76 | 1,413,894 | 231,849 90 | 2,792,172 | i 473,302 66 |
| Totals | 24,866,309 | $5,075,745 72 | 20,800,717 | $3,545,130 67 | 45,667,026 | $8,620,876 39 |

a. Includes 1,152,417 cubic yards, costing $287,676 68 in State of Arkansas.
b. " 71,241 " " " 13,715 69 in Orleans parish, right bank.
c. " 384 011 " " " 83,057 70 in Orleans parish, left bank.
d. " 1,049.292 " " " 177,241 89 in State of Arkansas
e. " 651,062 " " " 130,315 51 in Orleans parish, right bank.
f. " 445.845 " " " 86.892 67 in Orleans parish, left bank.
g. " 2,201,709 " " " 464,918 57 in State of Arkansas.
h. " 722 303 " " " 144,031 20 in Orleans parish, right bank.
i. " 829,856 " " " 169,950 37 in Orleans parish, left bank.

LETTER RELATIVE TO ENCROACHMENT BY WAVE-WASH UPON THE WEST BANK OF THE NEW BASIN CANAL AND SHELL ROAD.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 6, 1899.

*Mr. Lewis S. Graham, Member Board of Control, New Basin Canal and Shell Road, New Orleans, La.:*

DEAR SIR—In Major Richardson's absence, I take the liberty of answering your letter of the 4th inst.

We are ready to run in intermediate monuments from Metairie Ridge to West End, between those established by Mr. Grandjean, and determining the canal property line from his survey. We shall be glad to confer with your Board with regard to their character, shape and size.

We have carefully examined the banks of the canal between Metairie Ridge and West End, with a view to determining "to what extent the west bank has washed out." We find that owning to the lack of a base line of sufficient long standing and reliability, it is not possible to measure with great accuracy the amount of wash or chipping that has occurred; but there is unmistakable evidence that such recession has taken place, especially between the New Orleans & Western Railroad bridge and West End, and notably as you approach West End. In places the projection of roots and logs justify the belief that such recession has amounted to as much as fifteen feet, as these were originally evidently under the solid bank. This is corroborated by the encroachment upon the shell road. Moreover, this chipping process (due to waves and tides), is steadily progressing, as evidenced by the present steep condition of the bank, which is cracking in places on that stretch, and also by the fact that some of the temporary revetment which you have built is caving and toppling in under the pressure of the steep bank behind it.

We believe that the projecting stumps and logs, resulting from this recession of the bank, must somewhat endanger navigation, at certain stages of water, and, moreover, the chipping in of the bank tends to deteriorate the depth of the channel by filling it to the extent of the crumbling which occurs.

Very respectfully yours,
ARSENE PERRILLIAT,
*For the Board of State Engineers.*

---

RESOLUTION RELATIVE TO THE IMPROVEMENT OF BAYOU LAFOURCHE, LOUISIANA.

At a joint meeting of the Atchafalaya Basin Levee Board and the Lafourche Levee Board, called by His Excellency, Murphy J. Foster, Governor of Louisiana, and held in the Executive Office, at Baton Rouge, La., on May 21st, 1899, the following preamble and resolutions were unanimously adopted:

WHEREAS, In 1886 a plan was submitted to Congress by Major Heuer, Corps of Engineers, U. S. A., then in charge of this Engineer District, for the improvement of the navigation of Bayou Lafourche, by locks at its head and dredging a channel below, and said plan was adopted, and several appropriations made for its execution; and

WHEREAS, These appropriations were so small and irregular that they were only sufficient to partially complete the dredging without commencing the locks; and

WHEREAS, The exclusion of the silt loaded water of the river by locks is necessary for the permanence of the dredging, and such results as were obtained have, therefore, been lost; and

WHEREAS, The levee authorities of Louisiana have expended, since 1890, the sum of $1,010,000 on the enlargement and maintenance of the levees of Bayou Lafourche, and notwithstanding this enormous expenditure, destructive crevasses have occurred almost annually, and it is certain that at least equal expenditures averaging $100,000 per annum will be required for many years before the levee system of the bayou can be so advanced as to give reasonable security to the inhabitants on its banks; and

WHEREAS, The execution of the plan already adopted by Congress would not only improve the navigation of the bayou, but would also do away with the necessity of a levee system 170 miles in length, which has already cost at least $1,500,000, and will cost at least $2,000,000 more for its completion; and

WHEREAS, By the execution of the plan, the sums which would be required for the completion of these levees can and will be applied in co-operation with the United States Government in carrying out the plans of the Mississippi River Commission for the completion of the levee system of the Mississippi River; therefore, be it

*Resolved*, By the Commissioners for the Atchafalaya and Lafourche Levee District of Louisiana, assembled in convention by the Governor, that the Congress of the United States be and is hereby most urgently requested to make at the present session of Congress such appropriations as can be judiciously spent in two years for the immediate execution of its plan, which has already been delayed thirteen years.

*Be it further Resolved*, That the several levee organizations here assembled pledge that such sums as, in the absence of locks, would have been necessarily expended, in the future, on the Lafourche levees, and which have averaged annually over $112,00 for the past nine years, will, in case Congress takes this action, be expended in co-operation with the Government, and in accordance with the plans of the Mississippi River Commission, for the completion of the levees of the Mississippi River.

---

Among the resolutions unanimously adopted at the "Convention on Improvement of Western Waterways," held at Memphis, Tenn., on November 14th and 15th, 1899, was the following:

"*Resolved*, That we favor the construction of locks at the head of Bayou Lafourche, and the improvement of the same in accordance with the plan heretofore submitted by Major Heuer, of the Corps of Engineers."

# APPENDIX F.

**Circulars to Police Juries Relative to Public Roads, with Form of Specifications Suggested to be Embodied in Road Ordinances.**

# APPENDIX F.

## CIRCULARS TO POLICE JURIES RELATIVE TO PUBLIC ROADS.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 1, 1899.

*To the President of the Police Jury of the Parish of ——*

DEAR SIR—The Board of State Engineers will be greatly obliged to you for copies of such road ordinances as are now in force, or may hereafter be adopted in your parish, also of any parish maps that you can conveniently spare.

It is provided in the articles of the Constitution, relative to public roads, that this Board, when called upon to do so, shall furnish "such assistance and advice as will tend to create a uniform system of public roads throughout the State." We, therefore, desire to collect and compare the various ordinances and regulations of the several parishes on this subject, in order that we may give it intelligent consideration, and be prepared, if possible, in case we are called upon for such advice and assistance as the Constitution contemplates, to recommend such means and methods as have been approved by experience

We have already had some correspondence with the "Office of Road Inquiry," of the United States Department of Agriculture, and have consulted its various bulletins and circulars, as well as numerous other papers and treatises on road construction and maintenance, but have not yet found it practicable to prepare or adopt any general plan or specifications that would be applicable to the existing situation in all parts of the State. In a large proportion of our parishes there is no material available at reasonable cost for surfacing roads, except the natural earth on which they are located. This fact seems to make it almost useless for the present to urge any general undertaking of macadam, or even gravel roads. In a few parishes this kind of improvement may be not altogether impracticable; but as a general rule it would seem that the larger part of Louisiana must, at least, for some time to come, depend upon common earth roads.

The greatest and most obvious need for the maintenance and improvement of our common roads is better drainage. It is not sufficient to simply cut ditches along the roads themselves, for unless some outlet exists for the water, through which it can be carried away from the ditches adjacent to the road, it is of little use to make them.

If the road authorities will devote a larger share of their attention and labor to opening up natural drains, and cutting leading ditches or

canals, where necessary to finally dispose of the water that would otherwise stand alongside the roads, as authorized by Act No. 21, of 1898, we believe that it would result in great improvement of many of our worst roads.

We are also of the opinion that it will be found true economy for every road district to own and keep in operation one or more of the many excellent road machines which are now on the market at reasonable prices.

But our object in addressing you at this time, as previously stated, is to ask that you will kindly send us a copy of the road laws of your parish, and any information you can give us as to their operation, whether satisfactory or otherwise, with such suggestions as you may see fit to make relative to their change or improvement. We shall also be greatly obliged for any information you can supply us regarding the accessibility in your parish or vicinity of stone suitable for road metal (or otherwise), gravel, sand or other material that can be used in improving the surface of the public roads.

Trusting you may find it convenient to give us the information sought, without too much trouble, we remain,

Very respectfully,

THE BOARD OF STATE ENGINEERS,

Per HENRY B. RICHARDSON,

*Chief State Engineer.*

---

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 15, 1899.

*To the Honorable Police Jury of the Parish of——*

GENTLEMEN—The Board of State Engineers addressed a circular letter, under date of March 1, 1899, to the Presidents of Police Juries of all the parishes in the State, asking for copies of road ordinances, in force or that might be adopted, with a view to being prepared, when called to do so, to give "such assistance and advice as will tend to create a uniform system of public roads throughout the State," as is contemplated in Art. 294 of the Constitution.

Replies have been received from a dozen or more of the parishes, among which are a number of pamphlets containing elaborate road ordinances, some of which are of recent date, and appear to have been drawn up with much care and attention to details.

There is evidently a wide diversity of practice, not only in the manner of getting work done on the public roads and of raising means therefor, but also in the character of the roads themselves, which are required to be maintained under the regulations prescribed in different parishes.

This board has thought that the preparation of a few simple specifications which might be embodied in almost any road ordinance may

be useful to some of the parishes in framing their road laws, and tend toward the creation of a more uniform system, and has, therefore, drafted a form which is appended hereto, and which it is suggested may be made one of the sections of a road ordinance.

In preparing this suggested form it has been the endeavor to make the special requirements as plain and concise as possible, and only such as are of a general character; believing it wise, and often necessary, to leave a great many details to the common sense and good judgment of the local authorities.

It has not been thought worth while to include any special specifications for macadamized, graveled or other paved roads, nor for tile drainage, nor for special bridge construction, because whenever such improvements upon the common public roads become possible or desirable in localities of special importance, it will probably be necessary to have special specifications made for them.

The specifications suggested provide for dividing the roads into three classes. It is considered good policy to make some discrimination between roads that are in constant use by a large number of people, carrying the largest traffic between points of greatest importance, and those which only lead to remote settlements and are little used; and hence the provision suggested for roads of the first class and roads of the second class. There are also, in many parishes, incorporated towns and villages which are laid out in streets, with sidewalks and other peculiarities rendering them different from the ordinary public roads, which fact evidently calls for a third and special classification; and this condition has been provided for in the specifications suggested.

Article 291 of the Constitution appears to afford ample means for raising revenue to keep the public roads in repair, and to greatly improve their condition in parishes which avail themselves of its provisions. It is suggested that in cases where the license tax upon vehicles is imposed, that in order to encourage the use of wide-tired wheels, the minimum tax only be imposed upon vehicles of any class having tires of four inches wide and upward.

As regards the methods of working the roads, it is believed by this board that each road district should have one or more "road machines," with the necessary teams to operate them, and that the care of roads in each district should be put under some salaried officer of the parish or district, who should be held responsible for the proper use of the tools and appliances in his charge, and for the condition of the roads in his district.

A road ordinance adopted by the Police Jury of Ascension parish, on January 25, 1899, contains so many details as to methods of raising revenue for road purposes, and the manner of applying it, that it should supply valuable suggestions to other parishes in matters of road legislation. A copy is hereto appended.

Respectfully,

THE BOARD OF STATE ENGINEERS.

FORM OF SPECIFICATIONS SUGGESTED TO BE EMBODIED AS A SECTION OF ROAD ORDINANCE.

SECTION....., *Be it further Ordained, etc.*,

(Paragraph A.) That all the roads of this parish shall be classified as regards their importance and public utility, under three classes, viz: "Roads of the First Class," "Roads of the Second Class," and "Roads of the Third Class;" and that the following named and described roads are hereby declared to be roads of the first class, viz: From..... to....., from.....to....., etc.; that the following named and described roads are declared to be roads of the second class, viz: From.....to....., from.....to....., etc.; and that the following named and described roads and streets are declared to be roads of the third class, viz: From.....to....., from.....to....., etc., provided that this classification may be at any time changed or amended at any regular meeting by a majority vote of this body.

(Paragraph B.) Roads of the first class, shall have a clear width between side ditches of not less than twenty (20) feet; at least sixteen (16) feet of which shall be kept as a roadway for travel, with smooth surface, free from all obstructions, ruts, lumps or holes, and crowned up eight (8) inches higher in the centre than at the sides. The side ditches shall, wherever possible, be formed with sloping sides not steeper than one and a half horizontal to one vertical, and shall be so arranged that all water falling upon the roadway shall readily flow into them, and so that they, in turn, will discharge into natural drains, or into such canals and leading ditches, as may be available. Culverts, or covered cross-drains must be placed across the road wherever necessary. In case open ditches are used for such drainage, they must be bridged over with plank not less than two and one-half inches thick, and whatever form of cross-drain is used, whether pipes, culverts or bridged ditches, they must extend the full width of the road—namely, twenty feet.

All trees and stumps must be cut down to the ground in the space between side ditches, and in the sixteen-foot roadway all decayed stumps must be grubbed out by the roots and all other stumps cut off at least two feet under the surface of the roadway. No projecting limbs or branches must be allowed for a height of fifteen (15) feet over the surface of the sixteen-foot roadway, and all leaning trees or dead trees that might fall across or upon the roadway or side ditches must be felled. It is desirable to have the spaces between the sixteen-foot roadway and the slopes of the side ditches planted with Bermuda grass, which should be kept trimmed or grazed.

In case of roads located along hill-sides, the side ditch on the lower side of the road may be omitted; but ditches must be cut on the top of the bank on the upper side of the road to prevent, as far as possible, the water flowing down the hill-side from entering the road; and the side

ditches along the upper side of the road should be led across to the lower side of the road by frequent cross-drains.

When the character of the soil is such as to be easily washed, special care should be taken to prevent the formation of gullies, either in the side ditches themselves, or at the outfalls of the cross-ditches. Stone, brickbats, sods, brush staked down, or plank lining may be used for this purpose, but must be constantly watched and repaired to be effective.

In case of roads located along the base of public levees, the side ditches next to the levee must be made as small as possible, and will require frequent attention to keep them open. They must not be nearer than three (3) feet to the toe of the slope of the levee, and should not exceed one (1) foot in depth. They must be led across the road at frequent intervals by suitable cross-ditches.

Wherever it is necessary for the public road to cross the levee, suitable ramps or bridges must be built. They should not be steeper than ten horizontal to one vertical; they should be at least sixteen (16) feet wide, and should be raised not less than one (1) foot higher than the top of the levee. If ramps are built at an incline along the side of the levee, care must be taken that a gully is not formed on the side next to the levee, and, in any case, the levee must not be cut into or in any way changed or defaced.

Where roads cross creek bottoms or other low ground which cannot be kept drained, the roadway should be raised upon an embankment of such height as may be necessary or practicable. Such embankments should, if possible, be made twenty (20) feet wide on top, and must have side slopes not steeper than one and a half horizontal to one vertical. Where earth for their construction is taken from the sides, there must be a berme of the natural surface left undisturbed, at least ten (10) feet wide, between the foot of slope of the embankment and the pits from which earth is taken. These pits should be drained as much as circumstances will allow, to prevent their retaining stagnant water.

Bridges spanning opening of over six feet shall have substantial side railings with a clear width between same not less than fifteen (15) feet. They shall have floor plank not less than two and a half ($2\frac{1}{2}$) inches thick, which should be laid with quarter-inch openings between planks for drainage.

Fences or bridges must not be permitted nearer the centre of the road than twenty (20) feet, that is, lanes must be at least forty (40) feet wide between fences or hedges, or between toe of slope of levee and fence or hedge.

Leading ditches or canals must be cut wherever necessary, to drain the side ditches and cross-ditches into the natural water courses lying nearest the roads, or that may be most available, and all drains,

whether natural or artificial; that may assist in the complete drainage of the roads and their side ditches, must be kept open and clear of obstruction.

(Paragraph C.) Roads of the second class shall have a clear width of not less than eighteen (18) feet, unobstructed by trees, stumps, brush, projecting limbs and branches, ditches, gullies, bayou banks, fences, buildings or other impediments whatsoever to free passage, not less than twelve (12) feet of which width shall be kept as smooth and even as practicable and shall be worked as a roadway for travel. All limbs and branches shall be cut out for a height not less than twelve (12) feet over this roadway; and all stumps in same shall be cut off close to the surface of the road, or, if decayed, shall be grubbed out, and the holes so made solidly filled with earth. All natural drains that will tend to dry the roads must be kept open and improved wherever practicable. Necessary bridges across such drains may be built of logs and poles, if plank is not available. They should be at least fifteen (15) feet wide.

(Paragraph D.) Roads of the third class shall have such widths and surfaces and such provisions for drainage, and other details, as may be necessary, or may be prescribed by the authorities in charge of roads and streets in incorporated towns and villages for the roads and streets within their respective limits; or as may be hereafter prescribed by specific ordinances of this body in special cases where it may be deemed proper to make roads of a different class from those specified in paragraphs B and C as of the "first" and "second" classes.

---

## COPY OF ROAD ORDINANCE ADOPTED BY THE PARISH OF ASCENSIONS JANUARY 25, 1899.

To provide for the maintenance, repair and drainage of the public road, of the parish of Ascension, and to levy, collect and enforce payment of per capita and license taxes for said purposes, etc.

---

Section 1. Be it ordained by the Police Jury of the parish of Ascension, as follows:

a. That the parish of Ascension be divided into three road districts, to be known as the First, Second and Third Road Districts. That the first road district shall comprise the first, second and fourth police jury wards as now constituted; the second district shall comprise the fifth and sixth police jury wards, and the third district shall comprise the seventh and eighth police jury wards.

b. The members of the police jury in these districts and three freeholders residing in said districts, appointed by the President of the Police Jury, shall constitute three Boards of Road Supervisors, to be known respectively as the First, Second and Third District Road Boards.

Sec. 2.—a. That the parish purchase three road machines, three covered wagons, three one-mule carts, three scrapers, six plows with double and single trees, six spades, six shovels, three hoes, three hatchets, three axes, necessary curry combs, brushes and harness, six 2½ gallon galvanized buckets, three 1 gallon measures, and twelve mules.

Sec. 3.—a. That one man, to be known as foreman, and one helper be employed for each road district.

b. The foreman of each road district shall be responsible for the proper care of mules and implements in his district and all forage placed in his possession.

c. He and his helper will be employed by the day. The day shall be divided into quarters, and the foreman and his helper or helpers shall observe the same working time as generally observed by the employees on the sugar estates of this parish.

d. The foreman shall receive two dollars per day for actual time worked. He shall be allowed one-quarter of a day extra for Sundays and other whole days when not at work, for attending to stock. Each helper shall receive one dollar per day for actual time worked.

e. The foreman of each road district shall be elected by the District Road Board and shall have the following qualifications:

1. At least 21 and not over 55 years of age.
2. Able-bodied.
3. Reputation for honesty, sobriety and application to work.
4. Ability to read and write sufficiently to make out a legible monthly report.
5. Ability to supply, without compensation, a yard and stable for all mules and forage in his care.
6. He shall give solvent bond in the sum of three hundred dollars for the faithful care and use of stock and forage.

f. The helper shall possess like qualifications, excepting those prescribed by paragraphs 4, 5 and 6 of this section.

g. The foreman shall select his own helpers, but if said helpers, or any of them, become obnoxious to the Board in his district, or neglect their work, upon notice by the Board the foreman shall dispense with the services of such helpers and employ others instead.

h. The foreman and helpers shall abide by the rules, regulations and provisions of this ordinance, and such additional regulations as their respective District Boards may make, not in conflict with the regulations of this ordinance.

i. The foreman and helpers, as also extra labor, shall be paid by the Parish Treasurer upon the presentation to him of the monthly report, properly attested, as this ordinance provides.

RULES AND REGULATIONS GOVERNING ROAD BOARDS.

Sec. 4—a. The District Road Boards shall each elect a President and Secretary to serve twelve months; the officers and members to serve without compensation.

b. These Boards shall have charge of all public roads in their respective districts, and shall see that the road ordinance is properly executed, and wherever and whenever a new levee is constructed along the public road, the said District Road Boards shall and they are hereby authorized to contract with the levee contractors to lay out, ditch and drain a new road.

c. Their regular meetings shall be on the second Wednesday of each month, and the Presidents may, in cases of emergency, call extra meetings.

d. Necessary postal cards, writing material, printed blanks, etc., shall be supplied the Boards by the Parish Treasurer at the expense of the parish.

e. These Boards shall consider all public roads in their respective districts as classified into first and second grade roads.

f. The first grade roads shall be considered of the greater importance in work.

g. The Road Boards, besides a President and Secretary, shall have an officer to be known as Road Inspector.

h. Said inspector shall, once a week, go over all roads of the first grade in his district, and as often over roads of the second grade as practicable. He shall once a week visit the stables and localities where road mules and implements are kept and employees are at work, and shall examine the stock, feed, water, implements and road work carefully at each visit.

i. The Road Foreman and Road Inspector shall be under the orders of the District Road Board in each district and shall work and inspect such roads in such manner as the District Road Board may direct, following the general plan of road work contained in this ordinance, to-wit: Roads shall not be less than twenty-five feet wide, raised in the centre at least twelve inches more than at the sides, and shall have sufficient side or lateral drains, cross-ditches and bridges. Beyond this the inspector shall use his own discretion as to manner of repairing roads, after due consultation with the District Road Board of each district.

j. That the District Road Board and all contractors or employees of the police jury under this ordinance shall have the right to drain the public roads of this parish by cutting ditches and canals where necessary, over and through private property, provided that said drains are opened, and provided they shall be located where least injurious to the owner of the property. And any owner neglecting or refusing to permit such drainage as herein provided, shall be deemed guilty of a misdemeanor and, upon conviction before any court of competent jurisdiction, shall be fined not more than $20.00 or imprisonment not more than thirty days in the parish jail, or both, at the discretion of the court. Roads of the second grade shall also be drained in like manner in the interior settlements, but roads leading to such settlements shall be drained by property holders collectively benefited by said roads. No road of the second grade leading into an interior settlement shall be worked by the Board until the drainage of said road is good and satisfactory to said Board.

k. It shall be the duty of the Inspector to report any neglect of duty, disobedience or violations of the regulations applying to the road employees, to the Presidents of their respective Boards; and if the President deems the matter sufficiently urgent, he may call a special meeting of his Board, or, at a regular meeting, discharge the offender, with the concurrence of the Board; and in case of the foreman, the Board shall elect his successor; and if the offender be a helper the Board shall require the foreman to select another.

l. The Inspector shall hand in writing to the President of his Board, at the end of each month, a short report of the condition of stock, implements, forage and roads, and also a statement of the work in hand. The President shall deliver this report to the Inspector's successor.

m. Each Board is authorized to employ additional help at a price not to exceed ninety cents per day, but at no time more than three extra men, nor for any longer time than ten days in any one month, except in an extraordinary emergency.

n. Each Board is authorized to have necessary repairs of road implements made, and to purchase incidental articles that may be required, and when such bills are approved by the President of the Board ordering such repairs or articles, the Parish Treasurer shall pay them.

o. Each Board is authorized to make such additional regulations as may from time to time seem necessary or advantageous, not in conflict with the provisions of this ordinance.

p. The Inspectors shall each receive thirty dollars a month for their services. Their claims must be approved by the Presidents of the District Boards respectively and paid by the Parish Treasurer.

Sec. 5.—a. The Boards, through their Presidents, shall furnish their respective districts with all lumber and spikes required for bridge work, bridge plank to be 20 feet long, 2½ inches thick, and 10 and 12 inches wide. The District Road Board shall buy this lumber at lowest market prices, quality and prompt delivery considered.

b. The District Road Boards shall purchase, at the lowest market price, quality and delivery considered, such oats, hay, bran and rock salt in proper proportions as shall be directed by the President of each Board as may be required for a period of not less than three months, divided into separate lots for each road district. The Boards shall endeavor to obtain free storage of this forage in one or more warehouses at convenient distances in their respective districts, and shall obtain from their foremen receipts for such forage delivered into their possession.

RULES AND REGULATIONS FOR FOREMEN AND HELPERS.

Sec. 6.—a. Intoxication during term of employment shall be sufficient cause for the discharge of any road foreman, helper or other employee.

b. Foremen, inspectors and helpers must put in full time at work, unless prevented by sickness or bad weather; the Saturday half-holiday, Sundays and other legal holidays excepted.

c. The foremen, with their helpers, shall curry and brush mules properly once a day.

d. The feed and care of the mules shall be regulated by the District Road Board.

e. Helpers shall assist the foremen in attending to stock on days of work, but will not be obliged to do so on other days.

f. In case of collar sores, wounds and other ailments of stock, the foremen will use the proper remedies supplied them.

g. Foremen shall weigh or measure each day the food, as prescribed by the Board for stock, keeping an exact tally with the amount of forage of each kind supplied them.

h. Mules and implements are not to be used for private purposes.

i. Foremen shall obey the instructions of the Inspector.

j. Foremen will not be allowed to subrogate their work or positions to others. In the event of sickness or other sufficient cause, foremen may obtain a written permit from the Inspector to be replaced temporarily, not exceeding ten days any at one time. The foreman during replacement will still be held responsible for the stock, implements and forage.

k. In bad weather, or when it is too wet to use the road machines, in the absence of other instructions from inspectors foremen and helpers shall drain roads, fill up ruts and low places, and do such work as may not require road machines. When so ordered or needed, dirt shall be hauled in carts to low places.

l. At the end of each month foremen shall fill out two reports on blanks to be supplied by the Parish Treasurer. One they shall deliver to the President of their respective Boards, the other to the Parish Treasurer.

FORM OF REPORTS.

.....Road District, Ascension Parish.
Report for month of....., 18.....
Foreman....., No. days....., $2 per day.....$.....
Account for time lost..... If excused by Inspector state so.....
Append Inspector's permit to copy for President of Board.
Helper....., No days....., $1 per day..... $.....
Account for time lost..... If excused by Inspector state so..... Condition of mules and implements..... Sickness or sores on mules during the month..... I have fed out during the month.....pounds of oats, .....pounds of bran, .....pounds of hay. I have repaired roads in wards..... I have repaired bridges and ditches in wards.....
Sworn to before Clerk of Court.
Signature.....
Correct.....Inspector.
Approved.....Prest. Dist.

LEVY OF TAXES AND LICENSES TO RAISE REVENUE FOR ROADS AND BRIDGES.

Sec. 7. That in accordance with Article 291, of the Constitution of 1898, and in order to raise funds for the purposes of constructing, maintaining and repairing the public roads, bridges, etc., and to carry out this ordinance, there is hereby levied a one-mill tax per annum of the taxes levied by the police jury on the assessment rolls of this parish; and that there be imposed a per capita tax of one dollar upon each able-bodied male inhabitant of this parish between the ages of eighteen and fifty-five years, which imposition, however, shall not apply to or be operative in the town of Donaldsonville, and that there will be and the same is hereby levied and imposed, an annual license tax in accordance with Article 291, of the Constitution of 1898, upon each and every vehicle, including bicycles, kept and used for locomotion on public roads, and divided and graded in the following classes:

First—On all timber-wheels, floats, drays and vehicles used for heavy hauling, plantation carts using three or four mules, wagons, livery buggies and surreys used by doctors and agents, baker, butcher, ice and carbonated water delivery and peddling carts and hacks, and all vehicles generally, either two or four-wheeled, with or without springs, doing public hauling and operated for deriving a revenue—one dollar.

Second—On all private carriages, wagons, surreys, and two or three seated four-wheeled vehicles, with or without springs—seventy-five cents.

Third—On all private buggies, road carts, sulkies and one-seated two or four-wheeled vehicles, with or without springs, and all bicycles —fifty cents.

That no vehicle or bicycle shall be allowed or permitted to travel on the public roads of this parish without the proper license being previously paid, and as evidence of such payment tags or plates will be issued to the owner or owners of said vehicles and bicycles, which shall be furnished by the police jury and placed on or attached to said vehicles, showing that the license has been paid. Said tags or plates shall be numbered as follows, and issued consecutively: for class one, starting from No. 1; class two, from 01; class three, from 001.

That the police jury shall, in order to get a correct and full list of all vehicles liable to such annual license and ascertain all persons liable

to the per capita tax imposed by this ordinance, employ a competent person in each road district whose duty it shall be to make a complete list and enumeration of all vehicles and persons in their respective districts subject to said annual license and per capita tax. That said list and enumeration shall be filed in the Sheriff's office of this parish on or before the first day of April, 1899, and on or before the first day of February each and every year thereafter, and the Sheriff and *ex-officio* tax collector shall, through the persons appointed by the police jury to make said list and enumeration, collect as fast as possible from each owner or owners of vehicles used on the public roads of this parish, and all persons subject to a per capita tax the annual license and the per capita tax herein levied and imposed.

That said persons appointed by the police jury shall receive, as compensation for the performance of the duties of enumerators and collectors as herein prescribed, ten per cent. on all moneys collected by the Sheriff in their respective districts for annual licenses on vehicles and per capita tax.

That the annual license imposed upon vehicles, as aforesaid, shall only be collectible for vehicles used on the public roads; and the only legal evidence that such license on a vehicle has been paid, shall be the placing and attaching of the tag or plate herein provided upon such vehicle.

That if any person shall use a vehicle or bicycle on the public roads without first obtaining and paying the license herein provided, and placing and attaching to such vehicle the tags or plates herein provided for, the Sheriff shall, through the District Attorney, on motion in the proper court, take a rule on the party or parties refusing and neglecting to pay said annual license to show cause on the fifth day, exclusive of holidays, after service thereof, why said party or parties should not pay the amount of the license claimed, or be ordered not to use such vehicle on the public roads of this parish until after having obtained a license; and in case such rule is made absolute, the order thereon rendered shall be considered a judgment in favor of the parish for the amount deemed to be due by the defendant for license and penalty and costs hereinafter provided for, and shall be executed in the same manner as other judgments; and every violation of this order of the court shall be considered as a contempt thereof and be punished according to law.

That in case the payment of such license shall be enforced by rule as aforesaid, the defendant therein shall, besides paying the annual license, be liable to the payment of 2 per cent. per month on said license and 10 per cent. attorney's fees on the aggregate, and all costs of court.

Sec. 8.—a. That the revenues derived from the taxes and licenses imposed by this ordinance shall be allotted and appropriated to and expended in the road districts wherein they are respectively levied and collected; but such appropriations as are made for road purposes from the general parish tax levy shall be appropriated equally among the three road districts.

b. That every member of a District Road Board, every inspector, foreman, officer or employee under this ordinance, and all justices of the peace and constables of this parish are hereby authorized and empowered to enforce any and all the provisions of this ordinance.

c. That any pers n liable to the payment of the per capita tax, herein provided for, who shall fail and refuse to pay said tax, shall be deemed guilty of a misdemeanor, and, upon conviction before any court of competent jurisdiction, be imprisoned not more than five days or fined not more than five dollars, or both, at the discretion of the court.

Adopted by the police jury of Ascension parish in adjourned session regularly convened at Donaldsonville, La., January 25, 1899.

# APPENDIX G.

**High Water Records from 1872 to 1899, inclusive.**

## HIGH WATER RECORD—1872.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | April 13 | 41.75 | 468.14 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | April 14 | 20.95 | 419.45 | Miss. Riv. Com'n. |
| St. Paul | May 19 to 22 | 7.70 | 680.70 | Weather Bureau. |
| Davenport. | May 28. | 9.60 | 543.36 | Weather Bureau. |
| St. Louis | June 12 to 14 | 23.00 | 401.97 | Miss. Riv. Com'n. |
| Cairo | April 19-20 | 39.20 | 308.78 | Miss. Riv. Com'n. |
| Memphis | April 24 | 31.50 | 214.21 | Miss. Riv. Com'n. |
| Helena | April 26 | 39.03 | 179.75 | Miss. Riv, Com'n. |
| Mouth White River | April 30 to May 1 | 40.20 | 147.67 | Miss. Riv. Com'n. |
| Little Rock | May 20-21 | 26.00 | 246.29 | Miss. Riv. Com'n. |
| Lake Providence | May 1 | 35.15 | 103.51 | Miss. Riv. Com'n. |
| Vicksburg | May 2-3 | 39.50 | 84.28 | Miss. Riv. Com'n. |
| Natchez | May 2-5 | 39.85 | 55.48 | Miss. Riv. Com'n. |
| Red River Landing | May 6 | 39.42 | 40.01 | Miss. Riv. Com'n. |
| Baton Rouge | May 7 | 29.65 | 28.45 | Miss. Riv. Com'n. |
| Carrollton | May 6 | 12.30 | 11.95 | Miss. Riv. Com'n. |
| Alexandria | April 29 to May 1 | 33.30 | 76.50 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1873.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 21 | 41.50 | 467.86 | Miss. Riv. Com'n. |
| | December 19 | 44.42 | 470.78 | Miss. Riv. Com'n. |
| Louisville, upper gauge | February 21 | 17.10 | 415.60 | Miss. Riv. Com'n. |
| | December 19 | 18.30 | 416.80 | Miss. Riv. Com'n. |
| St. Paul | April 21 | 16.40 | 689.40 | Weather Bureau. |
| Davenport | May 8 | 12.90 | 546.66 | Weather Bureau. |
| Kansas City | July 5 | 19.30 | 736.00 | Weather Bureau. |
| St. Louis | April 11 | 25.45 | 404.42 | Miss. Riv. Com'n. |
| | June 10 | 25.25 | 404.22 | Miss. Riv. Com'n. |
| Cairo | February 26 | 41.25 | 311.13 | Miss. Riv. Com'n. |
| | April 12 | 40.60 | 310.18 | Miss. Riv. Com'n. |
| Memphis | March 3 | 32.50 | 215.21 | Miss. Riv. Com'n. |
| | April 17 | 31.85 | 214.56 | Miss. Riv. Com'n. |
| Helena | March 6 | 40.00 | 180.72 | Miss. Riv. Com'n. |
| | April 20 to 22 | 39.70 | 180.42 | Miss. Riv. Com'n. |
| Mouth White River | March 9 | 41.95 | 149.42 | Miss Riv. Com'n. |
| | April 25-26 | 42.90 | 150.37 | Miss. Riv. Com'n. |
| Little Rock | April 12 | 22.60 | 242.89 | Miss. Riv. Com'n. |
| Lake Providence | March 10 | 35.60 | 103.96 | Miss. Riv. Com'n. |
| | May 28 | 36.12 | 104.48 | Miss. Riv. Com'n. |
| Vicksburg | March 11 to 13 | 39.70 | 84.48 | Miss. Riv. Com'n. |
| | May 29-30 | 40.60 | 85.38 | Miss. Riv. Com'n. |
| Natchez | March 12-13 | 39.00 | 54.63 | Miss. Riv. Com'n. |
| | May 30 | 40.15 | 55.78 | Miss. Riv. Com'n |
| Alexandria | June 19-20 | 30.20 | 73.40 | Miss. Riv. Com'n. |
| Red River Landing | March 11 to 17 | 36.86 | 39.45 | Miss. Riv. Com'n. |
| | June 12 | 39.02 | 41.61 | Miss. Riv. Com'n. |
| Baton Rouge | March 16 | 28.32 | 27.02 | Miss. Riv. Com'n. |
| | June 17 | 29.85 | 28.65 | Miss. Riv. Com'n. |
| Carrollton | May 6, 29 and 31 | 12.68 | 12.33 | Miss. Riv. Com n. |
| | June 3-4 | 12.93 | 12.58 | Miss Riv. Com'n. |

## HIGH WATER RECORD—1874.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | January 13 | 46.75 | 473.11 | Miss. Riv. Com'n. |
| | February 26 | 44.00 | 470.36 | Miss. Riv. Com'n. |
| | May 2 | 46.00 | 472.36 | Miss. Riv. Com'n. |
| Louisville, upper gauge | January 13 | 22.22 | 420.72 | Miss. Riv. Com'n. |
| | February 26 | 22.35 | 420.85 | Miss. Riv. Com'n. |
| | May 3 | 22.00 | 420.50 | Miss. Riv. Com'n. |
| Nashville | April 17 | 49.60 | ..... | Miss. Riv. Com'n. |
| Chattanooga | May 1 | 29.58 | 660.22 | Miss. Riv. Com'n. |
| St. Paul | July 2 | 11.60 | 684.60 | Weather Bureau. |
| Davenport | March 9 | 15.60 | 549.36 | Weather Bureau. |
| Kansas City | June 17 to 20 | 16.20 | 732.90 | Weather Bureau. |
| St. Louis | April 24 | 17.85 | 396.82 | Miss. Riv. Com'n. |
| | June 19-20 | 18.40 | 397.37 | Miss. Riv. Com'n. |
| Cairo | April 26 | 47.37 | 316.95 | Miss. Riv. Com'n. |
| Memphis | May 2 | 34.00 | 216.71 | Miss. Riv. Com'n. |
| Helena | May 11 | 45.82 | 186.54 | Miss. Riv. Com'n. |
| Little Rock | April 25 | 23.00 | 243.29 | Miss. Riv. Com'n. |
| Lake Providence | March 21 to 23 | 37.37 | 105.73 | Miss. Riv. Com'n. |
| | April 29 to May 1 | 37.08 | 105.44 | Miss. Riv. Com'n. |
| Vicksburg | May 2 to 5 | 45.70 | 90.48 | Miss. Riv. Com'n. |
| Natchez | April 20 | 45.60 | 61.23 | Miss. Riv. Com'n. |
| Alexandria | May 8 to 10 | 34.90 | 78.10 | Miss. Riv. Com'n. |
| Red River Landing | April 16 | 47.00 | 49.59 | Miss. Riv. Com'n. |
| Baton Rouge | April 16 | 36.15 | 34.95 | Miss. Riv. Com'n. |
| Carrollton | April 15 | 15.95 | 15.60 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1875.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | March 2 | 42.58 | 468.94 | Miss. Riv. Com'n. |
| | August 6 | 55.33 | 481.69 | Miss. Riv. Com'n. |
| Louisville, upper gauge. | March 3 | 19.00 | 417.50 | Miss. Riv. Com'n. |
| | August 7 | 30.30 | 428.80 | Miss. Riv. Com'n. |
| Nashville | March 2 | 41.50 | ..... | Miss. Riv. Com'n. |
| Chattanooga | March 1 | 54.00 | 684.64 | Miss. Riv. Com'n. |
| St. Paul | April 16 | 18.00 | 691.00 | Weather Bureau. |
| Davenport | April 29 | 12.90 | 546.66 | Weather Bureau. |
| Omaha | April 27-28 | 17.80 | 976.51 | Weather Bureau. |
| Kansas City | April 30 | 17.80 | 734.50 | Weather Bureau. |
| St. Louis | May 2 | 24.60 | 403.57 | Miss. Riv. Com'n. |
| | July 11-12 | 28.75 | 407.72 | Miss. Riv. Com'n. |
| | August 3 | 29.80 | 408.77 | Miss. Riv. Com'n. |
| Cairo | March 21 | 43.66 | 313.24 | Miss. Riv. Com'n. |
| | August 8 | 45.12 | 314.70 | Miss. Riv. Com'n. |
| Memphis | March 29 | 32.85 | 215.56 | Miss. Riv. Com'n. |
| | August 15 to 17 | 33.05 | 215.76 | Miss. Riv. Com'n. |
| Helena | April 12 to 14 | 42.40 | 183.12 | Miss. Riv. Com'n. |
| Mouth White River | April 16 to 17 | 45.00 | 152.47 | Miss. Riv. Com'n. |
| Little Rock | May 5 | 21.00 | 241.29 | Miss. Riv. Com'n. |
| | August 5 | 21.80 | 242.09 | Miss. Riv. Com'n. |
| Lake Providence | April 19-20 | 37.29 | 105.65 | Miss. Riv. Com'n. |
| Vicksburg | April 21 | 43.00 | 87.78 | Miss. Riv. Com'n. |
| Natchez | April 25-26 | 41.85 | 57.44 | Miss. Riv. Com'n. |
| Shreveport | April 18 to 21 | 25.70 | 165.71 | Weather Bureau. |
| Alexandria | April 27 | 23.90 | 67.10 | Miss. Riv. Com'n. |
| Red River Landing | May 3 | 40.45 | 43.04 | Miss. Riv. Com'n. |
| Baton Rouge | May 13 | 29.75 | 28.55 | Miss. Riv. Com'n. |
| Carrollton | May 2 to 5 | 11.30 | 10.95 | Miss. Riv. Com'n. |
| | May 14 to 18 | 11.30 | 10.95 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1876.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | January 29 | 51.75 | 478.11 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | January 30 | 32.50 | 431.00 | Miss. Riv. Com'n. |
| Nashville | January 29 | 34.40 | ..... | Miss. Riv. Com'n. |
| | March 29 | 32.10 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 17 | 21.92 | 652.56 | Miss. Riv. Com'n. |
| St. Paul | April 10 | 10.00 | 684.00 | Weather Bureau. |
| Davenport | April 17 18 | 13.50 | 547.26 | Weather Bureau. |
| Omaha | July 4 | 14.60 | 973.31 | Weather Bureau. |
| Kansas City | June 16 | 18.00 | 734.70 | Weather Bureau. |
| St. Louis | May 10 | 32.00 | 410.97 | Miss Riv. Com'n. |
| Cairo | April 6-7 | 46.38 | 315.96 | Miss. Riv. Com'n. |
| Memphis | April 8-9 | 34.08 | 216.79 | Miss. Riv. Com'n. |
| Helena | April 18-19 | 44.85 | 185.57 | Miss. Riv. Com'n. |
| Mouth White River | April 8 to 15 | 46.70 | 154.17 | Miss. Riv. Com'n. |
| Little Rock | April 5 | 23.10 | 243.39 | Miss. Riv. Com'n. |
| | July 7 | 26.30 | 246.59 | Miss. Riv. Com'n. |
| Lake Providence | April 12 to 14 | 37.95 | 106.31 | Miss. Riv. Com'n. |
| Vicksburg | May 10 | 44.90 | 89.68 | Miss. Riv. Com'n. |
| Natchez | May 15-16 | 43.85 | 59.48 | Miss. Riv. Com'n. |
| Shreveport | April 9 to 12 | 31.50 | 171.51 | Weather Bureau. |
| Alexandria | April 17 | 32.80 | 76.00 | Miss. Riv. Com'n. |
| Red River Landing | May 15 | 45.41 | 48.00 | Miss. Riv. Com'n. |
| Baton Rouge | May 8 and 16 | 33.40 | 32.20 | Miss. Riv. Com'n. |
| Carrollton | May 11 | 12.70 | 12.35 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1877.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | January 20-21 | 53.25 | 479.01 | Miss. Riv. Com'n. |
| Louisville, upper | January 21-22 | 29.90 | 428.40 | Miss. Riv. Com'n. |
| Nashville | January 22 | 40.50 | | Miss. Riv. Com'n. |
| | April 12 | 34.80 | | Miss. Riv. Com'n. |
| Chattanooga | April 11 | 28.67 | 659.31 | Miss. Riv. Com'n. |
| St. Paul | May 25-26 | 7.70 | 680.70 | Weather Bureau. |
| Davenport | April 4-5 | 9.90 | 543.66 | Weather Bureau. |
| Omaha | June 13 | 17.40 | 976.11 | Weather Bureau. |
| Kansas City | June 10 | 22.20 | 738.90 | Weather Bureau. |
| St Louis | June 14 | 26.60 | 405.57 | Miss. Riv. Com'n. |
| Cairo | April 15 | 40.52 | 310.10 | Miss. Riv. Com'n. |
| Memphis | April 29 | 32.05 | 214.76 | Miss. Riv. Com'n. |
| Helena | April 30-May 1 | 41.80 | 182.52 | Miss. Riv. Com'n. |
| Mouth White River | May 6 | 44.60 | 152.07 | Miss. Riv. Com'n. |
| Little Rock | June 13 | 27.50 | 247.79 | Miss. Riv. Com'n. |
| Lake Providence | May 6-7 | 35.82 | 104.18 | Miss. Riv. Com'n. |
| Vicksburg | May 8 to 13 | 41.60 | 86.38 | Miss. Riv. Com'n. |
| Natchez | May 30-31 | 40.70 | 56.33 | Miss. Riv. Com'n. |
| Shreveport | May 11-12 | 29.80 | 169.81 | Weather Bureau. |
| Alexandria | May 18-19 | 25.45 | 68.65 | Miss. Riv. Com'n. |
| Red River Landing | June 1 to 3 | 40.55 | 43.14 | Miss. Riv. Com'n. |
| Baton Rouge | June 1 | 29.65 | 28.45 | Miss. Riv. Com'n. |
| Carrollton | June 4 and 8 | 11.10 | 10.75 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1878.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | March 17 | 33.33 | 459.69 | Miss. Riv. Com'n. |
| | December 1 | 38.00 | 464.36 | Miss. Riv. Com'n. |
| Louisville Upper Gauge | March 18 | 12.10 | 410.60 | Miss. Riv. Com'n. |
| | December 17 | 15.50 | 414.00 | Miss. Riv. Com'n. |
| Nashville | April 26 | 27.30 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 25 | 19.17 | 649.81 | Miss. Riv. Com'n. |
| St. Paul | March 17-18 | 6.40 | 679.40 | Weather Bureau. |
| Davenport | May 9 | 7.10 | 540.86 | Weather Bureau. |
| | July 17 | 7.20 | 540.96 | Weather Bureau. |
| Omaha | June 25-26 | 17.80 | 976.51 | Weather Bureau. |
| Kansas City | July 2 and 3 | 19.80 | 736.50 | Weather Bureau |
| St. Louis | June 15 | 25.75 | 404.72 | Miss. Riv. Com'n. |
| Cairo | April 29 | 37.04 | 306.62 | Miss. Riv. Com'n. |
| Memphis | May 2 | 29.10 | 211.81 | Miss. Riv. Com'n. |
| Helena | May 3-4 | 38.75 | 179.47 | Miss. Riv. Com'n. |
| Little Rock | May 28 | 24.30 | 244.59 | Miss. Riv. Com'n. |
| Lake Providence | March 22 to 24, | 35.80 | 104.16 | Miss. Riv. Com'n. |
| Vicksburg | March 24 to 27 | 40.95 | 85.73 | Miss. Riv. Com'n. |
| | April 15, 16 and 20 | 29.30 | 74.08 | Miss. Riv. Com'n. |
| | May 10 | 40.75 | 85.53 | Miss. Riv. Com'n. |
| Natchez | March 28 | 39.20 | 54.83 | Miss Riv Com n, |
| | April 15, 17 and 20 | 29.30 | 44.73 | Miss. Riv. Com'n. |
| | May 19 | 38.50 | 54.13 | Miss. Riv. Com'n. |
| Shreveport | January 31 | 28.40 | 168.41 | Weather Bureau. |
| Alexandria | March 13 | 27.10 | 70.30 | Miss. Riv. Com'n. |
| | July 1 | 23.20 | 66.40 | Miss. Riv. Com'n. |
| Baton Rouge | May 19 | 29.35 | 28.15 | Miss. Riv. Com'n. |
| Carrollton | March 21 | 11.30 | 10.95 | Miss Riv. Com'n. |
| | April 20-21 | 9.20 | 8.85 | Miss. Riv. Com'n. |
| | May 16 and 20 | 11.20 | 10.85 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1879.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 2 | 40.17 | 466.53 | Miss. Riv. Com'n. |
| | December 27 | 42.75 | 469.11 | Miss. Riv. Com'n. |
| Louisville, upper gauge | January 18 | 17.70 | 416.20 | Miss. Riv. Com'n. |
| | December 28-29 | 19.60 | 418.10 | Miss. Riv. Com'n. |
| Nashville | January 19 | 41.60 | | Miss. Riv. Com'n. |
| Chattanooga | January 15 | 38.00 | 668.64 | Miss. Riv. Com'n. |
| St. Paul | July 11 | 10.80 | 683.80 | Weather Bureau. |
| Davenport | May 31 to June 3 | 7.80 | 541.56 | Weather Bureau. |
| Omaha | April 9 | 17.00 | 975.71 | Weather Bureau. |
| Kansas City | June 30 | 19.20 | 735.90 | Weather Bureau. |
| St. Louis | April 14 | 17.90 | 396.87 | Miss. Riv. Com'n. |
| | July 3 | 21.15 | 400.12 | Miss. Riv. Com'n. |
| Cairo | January 26 | 36.00 | 305.58 | Miss. Riv. Com'n. |
| Memphis | January 29 | 28.10 | 210.81 | Miss. Riv. Com'n. |
| | March 14 | 16.00 | 198.71 | Miss. Riv. Com'n. |
| | Mar. 30 to April 1 | 24.40 | 207.11 | Miss. Riv. Com'n. |
| Helena | January 31 | 37.25 | 177.97 | Miss. Riv. Com'n. |
| | March 15 | 23.60 | 167.02 | Miss. Riv. Com'n. |
| | April 2 | 33.70 | 174.42 | Miss. Riv. Com'n. |
| Mouth White River | April 11-12 | 36.20 | 143.67 | Miss. Riv. Com'n. |
| Fort Smith | May 7 | 10.80 | 385.05 | Weather Bureau. |
| Little Rock | February 3 | 16.60 | 236.89 | Miss Riv. Com'n. |
| | May 9 | 12.00 | 232.29 | Miss. Riv. Com'n. |
| Lake Providence | February 14 to 16 | 36.00 | 104.36 | Miss. Riv. Com'n. |
| | March 17 | 24.25 | 92.61 | Miss. Riv. Com'n. |
| | April 14 | 32.07 | 100.43 | Miss. Riv. Com'n. |
| Vicksburg | February 17 | 39.45 | 84.23 | Miss. Riv. Com'n. |
| | March 18 | 27.60 | 72.38 | Miss. Riv. Com'n. |
| | April 14-15 | 36.80 | 80.08 | Miss. Riv. Com'n. |
| Natchez | February 17 to 20 | 36.80 | 52.43 | Miss. Riv. Com'n. |
| | March 16-17 | 26.80 | 42.43 | Miss. Riv. Com'n. |
| | April 16-17 | 34.65 | 50.28 | Miss. Riv. Com'n. |
| Shreveport | February 18 | 19.00 | 159.01 | Weather Bureau. |
| Alexandria | May 26 | 19.20 | 62.40 | Miss. Riv. Com'n. |
| Red River Landing | February 19-20 | 35.90 | 38.49 | Miss. Riv. Com'n. |
| Baton Rouge | February 15 to 17 | 26.10 | 24.90 | Miss. Riv. Com'n. |
| Carrollton | February 20 to 22 | 10.80 | 10.45 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1880.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 17 | 53.17 | 479.53 | Miss. Riv. Com'n. |
| Louisville, upper gauge | February 19 | 30.00 | 428.50 | Miss. Riv. Com'n. |
| Nashville | March 20 | 46.50 | ..... | Miss. Riv. Com'n. |
| Chattanooga | March 18 | 38.33 | 668.97 | Miss. Riv. Com'n. |
| St. Paul | June 17-18 | 15.20 | 688.20 | Weather Bureau. |
| Davenport | June 26 | 18.40 | 552.16 | Weather Bureau. |
| Omaha | July 9 | 17.10 | 975.81 | Weather Bureau. |
| Kansas City | July 10 to 12 | 16.70 | 733.40 | Weather Bureau. |
| St. Louis | July 12 | 25.50 | 404.47 | Miss. Riv. Com'n. |
| Cairo | March 22 | 44.60 | 314.18 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 26 | 34.15 | 241.44 | Miss. Riv. Com'n. |
| Memphis | March 24 to 29 | 33.40 | 216.11 | Miss. Riv Com'n. |
| Helena | March 31 | 43.70 | 184.42 | Miss Riv. Com'n. |
| Mouth White River | March 23 to 25 | 46.55 | 154.02 | Miss. Riv. Com'n. |
| Fort Smith | March 8 | 10.50 | 384.75 | Weather Bureau. |
| Little Rock | March 15 | 14.80 | 235.09 | Miss. Riv. Com'n. |
| Arkansas City | March 21 to 26 | 45.10 | 140.28 | Miss Riv. Com'n |
| Lake Providence | April 3 | 38.05 | 106.41 | Miss. Riv. Com'n. |
| Vicksburg | April 8-9 | 43.15 | 87.93 | Miss. Riv. Com'n. |
| Natchez | April 16 | 43.50 | 59.13 | Miss. Riv. Com'n. |
| Shreveport | April 4 | 23.20 | 163.21 | Weather Bureau. |
| Alexandria | April 11 to 13 | 21.80 | 65.00 | Miss. Riv. Com'n. |
| Red River Landing | April 22 to 24 | 44.05 | 46.64 | Miss. Riv. Com'n. |
| Baton Rouge | April 22 to 24 | 33.20 | 32.00 | Miss. Riv. Com'n. |
| Plaquemine | April 23 to 25 | 29.00 | 28.80 | Miss. Riv. Com'n. |
| College Point | April 20 to 22 | 21.30 | 21.28 | Miss. Riv. Com'n. |
| Carrollton | April 23 to 24 | 14.25 | 13.90 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1881.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 16 | 50.50 | 476.86 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 17 | 22.50 | 421.00 | Miss. Riv. Com'n. |
| Nashville | January 25 | 33.00 | ..... | Miss. Riv. Com'n. |
| | April 16 | 31.80 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 13 | 22.42 | 653.06 | Miss. Riv. Com'n. |
| St. Paul | April 29 | 19.70 | 692.70 | Weather Bureau. |
| Davenport | April 14 | 16.00 | 549.76 | Weather Bureau. |
| | October 25 to 27 | 17.70 | 551.46 | Weather Bureau. |
| Omaha | April 24-25 | 23.80 | 982.51 | Weather Bureau. |
| Kansas City | April 30 | 26.30 | 743.00 | Weather Bureau. |
| St. Louis | May 6 | 33.65 | 412.62 | Miss. Riv. Com'n. |
| Cairo | April 20 | 45.80 | 315.38 | Miss. Riv. Com'n. |
| Fulton, Tenn | April 26 | 34.27 | 241.56 | Miss. Riv. Com'n. |
| Memphis | March 2-3 | 31.70 | 214.41 | Miss. Riv. Com'n. |
| | April 27-28 | 33.30 | 216.01 | Miss. Riv. Com'n. |
| Helena | March 4-5 | 41.65 | 182.37 | Miss. Riv. Com'n. |
| | May 14 | 43.74 | 184.46 | Miss. Riv. Com'n. |
| Mouth White River | March 7 to 9 | 45.10 | 152.57 | Miss. Riv. Com'n. |
| | May 15 to 18 | 45.70 | 153.17 | Miss. Riv. Com'n. |
| Fort Smith | May 25 | 15.80 | 390.05 | Miss. Riv. Com'n. |
| Little Rock | February 20 | 18.40 | 238.69 | Miss. Riv. Com'n. |
| Arkansas City | May 17-18 | 44.30 | 139.48 | Miss. Riv. Com'n. |
| Lake Providence | March 11 | 36.17 | 104.53 | Miss. Riv. Com'n. |
| | May 10 | 35.90 | 104.26 | Miss. Riv. Com'n. |
| Vicksburg | March 10 | 41.85 | 86.63 | Miss. Riv. Com'n. |
| | May 10 | 41.62 | 86.40 | Miss. Riv. Com'n. |
| St. Joseph | March 13 | 39.20 | 70.68 | Miss. Riv. Com'n. |
| Natchez | March 16 to 19 | 40.80 | 56.43 | Miss. Riv. Com'n. |
| Shreveport | March 7 | 27.30 | 167.31 | Weather Bureau. |
| Alexandria | March 20 | 27.85 | 71.05 | Miss. Riv. Com'n. |
| Barbre's Landing | April 4 to 9 | 40.00 | 42.91 | Miss. Riv. Com'n. |
| Red River Landing | April 6 to 9 | 40.10 | 42.69 | Miss. Riv. Com'n. |
| Baton Rouge | April 8 | 39.05 | 29.85 | Miss. Riv. Com'n. |
| | June 2 to 4 | 29.90 | 28.70 | Miss. Riv. Com'n. |
| Plaquemine | April 3 to 5 | 26.00 | 25.80 | Miss. Riv. Com'n. |
| College Point | April 7 to 10 | 19.35 | 19.33 | Miss. Riv. Com'n. |
| | May 22 to 24 | 19.47 | 19.45 | Miss. Riv. Com'n. |
| | June 2 to 4 | 19.10 | 19.08 | Miss. Riv. Com'n. |
| Carrollton | April 12 | 12.55 | 12.20 | Miss. Riv. Com'n. |
| | May 26 to 30 | 12.40 | 12.05 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1882.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 21 | 58.58 | 484.94 | Miss. Riv. Com'n. |
| Louisville, upp'r guage | February 22 | 37.40 | 435.90 | Miss. Riv. Com'n. |
| Nashville | January 22 | 55.10 | ..... | Miss. Riv. Com'n. |
| | March 13 | 46.10 | ..... | Miss. Riv. Com'n. |
| Chattanooga | January 19 | 40.17 | 670.81 | Miss. Riv. Com'n. |
| St. Paul | April 13 | 13.30 | 686.30 | Weather Bureau. |
| Davenport | April 23 | 14.10 | 547.86 | Weather Bureau. |
| Omaha | June 28-29 | 14.50 | 973.21 | Weather Bureau. |
| Kansas City | July 3 | 19.20 | 735.90 | Weather Bureau. |
| St. Louis | July 5-6 | 32.20 | 411.17 | Miss. Riv. Com'n. |
| Cairo | February 26 | 51.87 | 321.45 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 1 | 36.69 | 243.98 | Miss. Riv. Com'n. |
| Memphis | March 6 to 9 | 35.15 | 217.86 | Miss. Riv. Com'n. |
| Helena | March 9 | 47.20 | 187.92 | Miss. Riv. Com'n. |
| Mouth White River | February 28 | 48.40 | 155.87 | Miss. Riv. Com'n. |
| Fort Smith | February 23 | 21.80 | 396.05 | Weather Bureau. |
| Little Rock | February 25 | 25.70 | 245.99 | Miss. Riv. Com'n. |
| | May 12 | 24.70 | 244.99 | Miss. Riv. Com'n. |
| Arkansas City | February 28 | 47.00 | 142.18 | Miss. Riv. Com'n. |
| Greenville | February 27 | 41.68 | 128.42 | Miss. Riv. Com'n. |
| | March 17 | 41.44 | 128.18 | Miss. Riv. Com'n. |
| Lake Providence | March 20 | 38.32 | 106.68 | Miss. Riv. Com'n. |
| Vicksburg | March 20-21 | 48.75 | 93.53 | Miss. Riv. Com'n. |
| St. Joseph | March 20 | 44.90 | 76.38 | Miss. Riv. Com'n. |
| Natchez | March 28-29 | 47.75 | 63.38 | Miss. Riv. Com'n. |
| Shreveport | February 21 | 31.40 | 171.41 | Weather Bureau. |
| Alexandria | March 17 to 19 | 34.85 | 78.05 | Miss. Riv. Com'n. |
| Barbre's Landing | March 27 | 49.90 | 52.81 | Miss. Riv. Com'n. |
| Red River Landing | March 27 | 48.50 | 51.09 | Miss. Riv. Com'n. |
| Baton Rouge | March 26 | 35.95 | 34.75 | Miss. Riv. Com'n. |
| Plaquemine | March 21 to 27 | 31.30 | 31.10 | Miss. Riv. Com'n. |
| College Point | March 22 to 26 | 23.13 | 23.11 | Miss. Riv. Com'n. |
| Carrollton | March 27 | 14.95 | 14.60 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1883.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 15 | 66.33 | 492.69 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 16 | 43.80 | 442.30 | Miss. Riv. Com'n. |
| Nashville | February 14 | 41.60 | | Miss. Riv. Com'n. |
| Chattanooga | January 23 | 38.17 | 668.81 | Miss. Riv. Com'n. |
| St Paul | April 22 | 12.50 | 685.50 | Weather Bureau. |
| Davenport | May 1-2 | 13.20 | 546.96 | Weather Bureau. |
| Omaha | July 8 | 15.20 | 973.91 | Weather Bureau. |
| Kansas City | June 26 | 23.80 | 740.50 | Weather Bureau. |
| St. Louis | February 26 | 26.25 | 405.22 | Miss. Riv. Com'n. |
| | May 23 | 26.50 | 405.47 | Miss. Riv. Com'n. |
| | June 26 | 34.80 | 413.77 | Miss. Riv. Com'n. |
| Cairo | February 27 | 52.17 | 321.75 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 2 | 36.29 | 243.58 | Miss. Riv. Com'n. |
| Memphis | March 6 to 8 | 34.75 | 217.46 | Miss. Riv. Com'n. |
| Helena | March 8-9 | 46.90 | 187.62 | Miss. Riv. Com'n. |
| Mouth White River | March 9 to 12 | 48.00 | 155.47 | Miss. Riv. Com'n. |
| Fort Smith | February 17 | 21.80 | 396.05 | Weather Bureau. |
| Little Rock | February 19 | 25.80 | 246.09 | Miss. Riv. Com'n. |
| | June 14 | 25.40 | 245.69 | Miss. Riv. Com'n. |
| Arkansas City | March 11 | 46.32 | 141.50 | Miss. Riv. Com'n |
| Greenville | March 10 | 40.40 | 127.14 | Miss. Riv Com'n. |
| Lake Providence | March 11 to 14 | 36.47 | 104.83 | Miss. Riv. Com'n. |
| Vicksburg | April 7 | 43.80 | 88.58 | Miss. Riv. Com'n. |
| St. Joseph | April 7 | 41.90 | 73.38 | Miss. Riv. Com'n. |
| Natchez | April 7 to 9 | 44.00 | 59.63 | Miss. Riv. Com'n, |
| Shreveport | March 11-12 | 25.30 | 165.31 | Weather Bureau. |
| Alexandria | March 27 | 25.45 | 68.65 | Miss. Riv. Com'n. |
| Barbre's Landing | April 9-10 | 46.30 | 49.21 | Miss. Riv. Com'n. |
| Red River Landing | April 9 | 45.20 | 47.79 | Miss. Riv. Com'n. |
| Baton Rouge | April 9 | 35.08 | 33.88 | Miss. Riv. Com'n. |
| Plaquemine | April 9 | 30.73 | 30.53 | Miss. Riv. Com'n. |
| College Point | April 9 | 23.40 | 23.38 | Miss. Riv. Com'n. |
| Carrollton | April 7 | 15.40 | 15.05 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1884.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 14 | 71.06 | 497.42 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 16 | 46.60 | 445.10 | Miss. Riv. Com'n. |
| Nashville | March 15-16 | 48.30 | ..... | Miss. Riv. Com'n. |
| Chattanooga | March 10 | 42.83 | 673.47 | Miss. Riv. Com'n. |
| St. Paul | May 5 to 7 | 10.20 | 683.20 | Weather Bureau. |
| Davenport | March 28-29 | 11.90 | 545.66 | Weather Bureau. |
| | October 18-19 | 11.30 | 545.06 | Weather Bureau. |
| Omaha | March 24 | 15.50 | 974.21 | Weather Bureau. |
| Kansas City | July 5 to 7 | 17.20 | 733.90 | Weather Bureau. |
| St. Louis | April 9-10 | 28.10 | 407.07 | Miss. Riv. Com'n. |
| Cairo | February 22 to 24. | 51.79 | 321.37 | Miss. Riv. Com'n. |
| Fulton, Tenn | February 25 to 29. | 35.68 | 242.97 | Miss. Riv. Com'n. |
| Memphis | March 1 to 3 | 34.15 | 216.86 | Miss. Riv. Com'n. |
| Helena | March 6 | 47.00 | 187.72 | Miss. Riv. Com'n. |
| Mouth of White River | March 7-8 | 47.90 | 155.37 | Miss. Riv. Com'n. |
| Fort Smith | February 14 | 27.90 | 402.15 | Weather Bureau. |
| Little Rock | February 15 | 30.60 | 250.89 | Miss Riv Com'n. |
| Arkansas City | March 7 to 9 | 46.50 | 141.88 | Miss. Riv. Com'n. |
| Greenville | March 8 | 41.10 | 127.84 | Miss. Riv. Com'n. |
| Lake Providence | March 23-24 | 38.40 | 106.76 | Miss. Riv. Com'n. |
| Vicksburg | March 25 | 49.00 | 93.78 | Miss. Riv. Com'n. |
| St. Joseph | March 24 | 44.89 | 76.35 | Miss. Riv. Com'n. |
| Natchez | March 24 to 29 | 47.40 | 63.03 | Miss. Riv. Com'n. |
| Shreveport | February 27 | 32.60 | 172.61 | Weather Bureau. |
| | May 14 | 32.70 | 172.71 | Weather Bureau. |
| Alexandria | March 8-9 | 33.60 | 76.80 | Miss. Riv. Com'n. |
| | June 1 | 35.25 | 78.45 | Miss. Riv. Com'n. |
| Barbre's Landing | March 30-31 | 48.60 | 51.51 | Miss. Riv. Com'n. |
| Red River Landing | March 29 to 31 | 47.30 | 49.89 | Miss. Riv. Com'n. |
| Baton Rouge | March 24 | 36.20 | 35.00 | Miss. Riv. Com'n. |
| Plaquemine | March 24 | 31.60 | 31.40 | Miss. Riv. Com'n. |
| College Point | March 24 | 24.05 | 24.03 | Miss. Riv. Com'n. |
| Carrollton | March 18 | 15.60 | 15.25 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1885.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | January 20 | 46.00 | 472.36 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | January 21 | 21.70 | 420.20 | Miss. Riv. Com'n. |
| Nashville | January 21 | 37.80 | | Miss. Riv. Com'n. |
| Chattanooga | January 18 | 26.50 | 657.14 | Miss. Riv. Com'n. |
| | November 9 | 30.40 | 661.04 | Miss. Riv. Com'n. |
| St. Paul | June 18-19 | 7.40 | 680.40 | Weather Bureau. |
| Davenport | May 9 | 10.00 | 543.76 | Weather Bureau. |
| Omaha | June 17 | 16.60 | 975.31 | Weather Bureau. |
| Kansas City | June 19 | 19.10 | 735.80 | Weather Bureau. |
| St. Louis | March 16 | 24.10 | 403.07 | Miss. Riv. Com'n. |
| | May 3 | 26.10 | 405.07 | Miss. Riv. Com'n. |
| | June 17 | 27.10 | 406.07 | Miss. Riv. Com'n. |
| Cairo | January 26 | 39.00 | 308.58 | Miss. Riv. Com'n. |
| | April 28 | 38.22 | 307.80 | Miss Riv. Com'n. |
| Fulton, Tenn. | January 28 | 29.92 | 237.21 | Miss. Riv. Com'n. |
| | May 1 | 28.70 | 235.99 | Miss. Riv. Com'n. |
| Memphis | January 28 | 29.25 | 211.96 | Miss. Riv. Com'n. |
| | May 1-2 | 27.30 | 210.01 | Miss. Riv. Com'n. |
| Helena | January 30 | 40.70 | 181.42 | Miss. Riv. Com'n. |
| | May 4 | 38.75 | 179.45 | Miss. Riv. Com'n. |
| Mouth White River | January 23 to 25 | 43.60 | 151.07 | Miss. Riv. Com'n. |
| | May 5 to 7 | 43.50 | 150.97 | Miss. Riv. Com'n. |
| Fort Smith | April 26 | 27.90 | 402.15 | Weather Bureau. |
| Little Rock | April 27 to 29 | 28.60 | 248.89 | Miss. Riv. Com'n. |
| Arkansas City | Jan. 28 to Feb. 1 | 41.70 | 136.88 | Miss. Riv. Com'n. |
| | May 8 | 42.60 | 137.78 | Miss. Riv. Com'n. |
| Greenville | Jan. 31 to Feb. 1 | 37.60 | 124.34 | Miss. Riv. Com'n. |
| | May 8 | 38.05 | 124.79 | Miss. Riv. Com'n. |
| Lake Providence | February 1 to 3 | 34.75 | 103.11 | Miss. Riv. Com'n. |
| | May 10-11 | 35.55 | 103.91 | Miss. Riv. Com'n. |
| Vicksburg | February 3 | 42.40 | 87.18 | Miss. Riv. Com'n. |
| St. Joseph | February 3 | 38.37 | 69.85 | Miss. Riv. Com'n. |
| Natchez | February 3 to 5 | 42.60 | 58.23 | Miss Riv. Com'n. |
| Shreveport | January 16 | 28.60 | 168.61 | Weather Bureau. |
| | May 11-12 | 30.50 | 170.51 | Weather Bureau. |
| Barbre's Landing | February 5-6 | 41.60 | 44.51 | Miss. Riv. Com'n. |
| Red River Landing | February 5-6 | 41.96 | 44.55 | Miss. Riv. Com'n. |
| Baton Rouge | Jan. 30 to Feb. 2 | 31.90 | 30.70 | Miss. Riv. Com'n. |
| Plaquemines | Jan. 30 to Feb. 5 | 27.70 | 27.50 | Miss. Riv. Com'n. |
| College Point | January 30-31 | 21.05 | 21.03 | Miss. Riv. Com'n. |
| Carrollton | January 22-23 | 13.55 | 13.20 | Miss. Riv. Com'n. |
| | May 10 | 12.65 | 12.30 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1886.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | April 9 | 55.75 | 482.11 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | April 10 | 32.70 | 431.20 | Miss. Riv. Com'n. |
| Nashville | April 10-11 | 49.30 | ..... | Miss. Riv. Com'n. |
| Chattanooga | April 3 | 52.20 | 682.84 | Miss. Riv. Com'n. |
| St. Paul | March 29 to 31 | 8 20 | 681.20 | Weather Bureau. |
| Davenport | May 2 | 12.70 | 546.46 | Weather Bureau. |
| Omaha | June 11-12 | 12.90 | 971.60 | Weather Bureau. |
| Kansas City | April 17 | 15.80 | 732.50 | Weather Bureau. |
| St. Louis | February 13 | 23.20 | 402.17 | Miss. Riv. Com'n. |
| | April 21 | 23.70 | 402.67 | Miss. Riv. Com'n. |
| | May 13 | 27.00 | 405.97 | Miss. Riv. Com'n. |
| Cairo | April 19 | 50.98 | 320.56 | Miss. Riv. Com'n. |
| Fulton, Tenn | April 22 | 35.36 | 242.65 | Miss. Riv. Com'n. |
| Memphis | April 28 | 34.80 | 217.51 | Miss. Riv. Com'n. |
| Helena | April 30 | 48.10 | 188.82 | Miss. Riv. Com'n. |
| Mouth White River | May 4 | 48.20 | 155.67 | Miss. Riv. Com'n. |
| Fort Smith | February 14 | 14.90 | 389.15 | Weather Bureau. |
| Little Rock | February 16 | 17.90 | 238.19 | Miss. Riv. Com'n. |
| | April 19 | 16.10 | 236.39 | Miss. Riv. Com'n. |
| Arkansas City | May 5 | 46.90 | 142.08 | Miss. Riv. Com'n. |
| Greenville | May 6 | 41.17 | 127.91 | Miss. Riv. Com'n. |
| Lake Providence | May 7 | 37.91 | 106.27 | Miss. Riv. Com'n. |
| Vicksburg | May 7 to 9 | 44.15 | 88.93 | Miss. Riv. Com'n. |
| Natchez | May 9 to 11 | 43.75 | 59.38 | Miss. Riv. Com'n. |
| Fulton, Ark | April 21 | 20.90 | 244.42 | Weather Bureau. |
| Shreveport | April 29 | 18.30 | 158.31 | Weather Bureau. |
| Alexandria | June 17 | 27.90 | 71.10 | Miss. Riv. Com'n. |
| Barbre's Landing | May 30-31 | 41.80 | 44.71 | Miss. Riv. Com'n. |
| Red River Landing | May 31 | 41.94 | 44.53 | Miss. Riv. Com'n. |
| Baton Rouge | May 31 to June 2. | 32.10 | 30.90 | Miss. Riv. Com'n. |
| Carrollton | May 31 | 13.80 | 13.45 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1887.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 28 | 54.54 | 480.90 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 6 | 32.55 | 431.05 | Miss. Riv. Com'n. |
| Nashville | March 2 | 44.25 | | Miss. Riv. Com'n. |
| Chattanooga | Feb. 28-March 1 | 27.30 | 657.94 | Miss. Riv. Com'n. |
| St. Paul | April 17 | 9.60 | 682.60 | Weather Bureau. |
| Davenport | April 28-29 | 11.50 | 555.26 | Weather Bureau. |
| Omaha | March 28 | 17.90 | 976.61 | Weather Bureau. |
| Kansas City | April 1 | 20.20 | 736.90 | Weather Bureau. |
| St. Louis | March 19 | 20.10 | 399.07 | Miss. Riv. Com'n. |
| | April 1 | 20.40 | 399.37 | Miss. Riv. Com'n. |
| Cairo | March 9-10 | 48.48 | 318.06 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 12-13 | 34.60 | 241.89 | Miss. Riv. Com'n. |
| Memphis | March 10 | 35.30 | 218.01 | Miss. Riv. Com'n. |
| Helena | March 21-22 | 46.30 | 187.02 | Miss. Riv. Com'n. |
| Mouth White River | March 24-25 | 47.75 | 155.22 | Miss. Riv. Com'n. |
| Little Rock | May 6 | 17.55 | 237.84 | Miss. Riv. Com'n. |
| Arkansas City | March 25-26 | 46.65 | 141.83 | Miss. Riv. Com'n. |
| Greenville | March 21 to 25 | 40.80 | 127.54 | Miss. Riv. Com'n. |
| Lake Providence | March 26 | 38.00 | 106.36 | Miss. Riv. Com'n. |
| Vicksburg | March 26 to 31 | 44.70 | 89.48 | Miss. Riv. Com'n. |
| Natchez | March 31 | 44.20 | 59.83 | Miss. Riv. Com'n. |
| Fulton, Ark | May 9 | 24.60 | 248.12 | Weather Bureau. |
| | December 12 | 27.50 | 251.02 | Weather Bureau. |
| Shreveport | December 24-25 | 21.60 | 161.61 | Miss. Riv. Com'n. |
| Alexandria | March 24 | 14.92 | 58.12 | Miss. Riv. Com'n. |
| | December 28-29 | 19.25 | 62.45 | Miss. Riv. Com'n. |
| Barbre's Landing | April 9 | 43.10 | 46.91 | Miss. Riv. Com'n. |
| Red River Landing | April 8 | 43.00 | 45.59 | Miss. Riv. Com'n. |
| Baton Rouge | April 10 | 33.55 | 32.35 | Miss. Riv. Com'n. |
| Carrollton | April 6 to 9 | 14.50 | 14.15 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1888.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | March 31 | 39.75 | 466.11 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | April 1-2 | 16.05 | 414.55 | Miss. Riv. Com'n. |
| Nashville | March 30 | 39.25 | ..... | Miss. Riv. Com'n. |
| Chattanooga | January 19 | 25.70 | 656.34 | Miss. Riv. Com'n. |
| | March 31 | 27.00 | 657.54 | Miss. Riv. Com'n. |
| St. Paul | May 11 | 14.10 | 687.10 | Weather Bureau. |
| Davenport | May 15-16 | 18.60 | 552.36 | Weather Bureau. |
| Omaha | June 30 | 16.30 | 975.01 | Weather Bureau. |
| Kansas City | July 2-3 | 20.40 | 737.10 | Weather Bureau. |
| St. Louis | June 4 | 29.38 | 408.35 | Miss. Riv. Com'n. |
| Cairo | April 4 | 45.25 | 314.83 | Miss. Riv. Com'n. |
| Fulton, Tenn | April 10 | 33.60 | 240.89 | Miss. Riv. Com'n. |
| Memphis | April 11-12 | 34.20 | 216.91 | Miss Riv. Com'n. |
| Helena | April 14-15 | 42.80 | 183.52 | Miss. Riv. Com'n. |
| Mouth White River | April 20 | 45.55 | 153.02 | Miss. Riv. Com'n. |
| Fort Smith | April 30 to May 2 | 16.30 | 390.55 | Weather Bureau. |
| Little Rock | May 23 | 20.30 | 240.59 | Miss. Riv. Com'n. |
| Arkansas City | April 22 | 45.37 | 140.55 | Miss. Riv. Com'n. |
| Greenville | April 22-23 | 40.55 | 147.29 | Miss. Riv. Com'n. |
| Lake Providence | April 24-25 | 38.10 | 106.46 | Miss. Riv. Com'n. |
| Vicksburg | April 26 | 44.17 | 88.95 | Miss. Riv. Com'n. |
| Natchez | April 27 to May 1 | 43.40 | 59.03 | Miss. Riv. Com'n. |
| Fulton, Ark | May 7 | 31.80 | 255.32 | Weather Bureau. |
| Shreveport | March 18 | 29.70 | 169.71 | Miss. Riv. Com'n. |
| | May 19 | 30.30 | 170.31 | Miss. Riv. Com'n. |
| Alexandria | March 27-28 | 29.60 | 72.80 | Miss Riv. Com'n. |
| Barbre's Landing | May 1 to 3 | 40.70 | 43.61 | Miss. Riv. Com'n. |
| Red River Landing | April 30 | 41.75 | 44.34 | Miss. Riv. Com'n. |
| Baton Rouge | April 29 to May 3 | 32.50 | 31.30 | Miss. Riv. Com'n. |
| Carrollton | April 26 | 14.35 | 14.00 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1889.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Cincinnati | February 22 | 38.08 | 464.44 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 23 | 13.80 | 412.30 | Miss. Riv. Com'n. |
| Nashville | February 21 | 35.75 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 18 | 29.60 | 660.24 | Miss. Riv. Com'n. |
| St. Paul | May 21 | 4.50 | 677.50 | Weather Bureau. |
| Davenport | April 4-5 | 5.30 | 539.06 | Weather Bureau. |
| Omaha | July 1 | 9.70 | 968.41 | Weather Bureau. |
| Kansas City | August 14 | 13.90 | 730.60 | Weather Bureau. |
| St. Louis | March 5 | 16.60 | 395.57 | Miss. Riv. Com'n. |
| | June 1 | 24.62 | 403.59 | Miss. Riv. Com'n. |
| Cairo | February 26 | 32.80 | 302.38 | Miss. Riv. Com'n. |
| | June 24 | 34.50 | 304.08 | Miss. Riv. Com'n. |
| Fulton, Tenn | January 22-23 | 22.85 | 230.14 | Miss. Riv. Com'n. |
| | February 28 | 23.95 | 231.24 | Miss. Riv. Com'n. |
| | June 26 | 25.64 | 232.93 | Miss. Riv. Com'n. |
| Memphis | January 24 | 23.80 | 206.51 | Miss. Riv. Com'n. |
| | June 27 | 26.55 | 209.26 | Miss. Riv. Com'n. |
| Helena | January 25 | 31.35 | 172.07 | Miss. Riv. Com'n. |
| | June 28 | 34.10 | 174.82 | Miss. Riv. Com'n. |
| Mouth White River | January 26 | 37.10 | 144.57 | Miss. Riv. Com'n. |
| | June 29-30 | 37.65 | 145.12 | Miss. Riv. Com'n. |
| Fort Smith | March 26 | 20.00 | 394.25 | Weather Bureau. |
| Little Rock | January 19-20 | 23.00 | 243.29 | Miss. Riv. Com'n. |
| | March 28 | 23.05 | 243.34 | Miss. Riv. Com'n. |
| Arkansas City | January 27 | 35.50 | 130.68 | Miss. Riv. Com'n. |
| | March 8-9 | 35.00 | 130.18 | Miss. Riv. Com'n. |
| | June 30 | 36.25 | 131.43 | Miss. Riv. Com'n. |
| Greenville | January 27 | 31.60 | 118.34 | Miss. Riv. Com'n. |
| | March 7 | 30.65 | 118.39 | Miss. Riv. Com'n. |
| | July 1 | 31.82 | 118.56 | Miss. Riv. Com'n. |
| Lake Providence | January 29 | 28.78 | 97.14 | Miss. Riv. Com'n. |
| | March 9-10 | 28.30 | 96.66 | Miss. Riv. Com'n. |
| | July 1 | 29.40 | 97.77 | Miss. Riv. Com'n. |
| Vicksburg | January 29 | 33.78 | 78.56 | Miss. Riv. Com'n. |
| | March 11 | 33.55 | 78.33 | Miss. Riv. Com'n. |
| | July 3 | 34.43 | 79.21 | Miss. Riv. Com'n. |
| St. Joseph | February 1 | 30.25 | 63.73 | Miss. Riv. Com'n. |
| | March 12 | 30.35 | 63.83 | Miss. Riv. Com'n. |
| | July 3 | 30.58 | 64.06 | Miss. Riv. Com'n. |
| Natchez | Jan. 30 to Feb. 1 | 33.80 | 49.43 | Miss. Riv. Com'n. |
| | March 12-13 | 34.15 | 49.78 | Miss. Riv. Com'n. |
| | July 5 | 33.65 | 49.28 | Miss. Riv. Com'n. |
| Fulton, Ark | January 20 | 30.80 | 254.32 | Weather Bureau. |
| Shreveport | February 3 | 31.90 | 171.91 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1889.—Continued.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Alexandria | February 13 | 31.50 | 74.70 | Miss. Riv. Com'n. |
| Barbre's Landing | February 14 | 33.60 | 36.51 | Miss. Riv. Com'n. |
| | March 14 | 33.50 | 36.41 | Miss. Riv. Com'n. |
| Red River Landing | February 12 | 33.60 | 36.19 | Miss. Riv. Com'n. |
| | March 14 | 33.99 | 36.58 | Miss. Riv. Com'n. |
| | July 5-6 | 31.76 | 34.35 | Miss. Riv. Com'n. |
| Bayou Sara | February 12-13 | 27.50 | 30.19 | Miss. Riv. Com'n. |
| | March 13-14 | 28.00 | 30.59 | Miss. Riv. Com'n. |
| | July 5-6 | 25.50 | 28.09 | Miss. Riv. Com'n. |
| Baton Rouge | February 12 | 26.20 | 25.00 | Miss. Riv. Com'n. |
| | March 14 | 26.75 | 25.55 | Miss. Riv. Com'n. |
| | July 6 | 24.40 | 23.20 | Miss Riv. Com'n. |
| Plaquemine | February 12-13 | 22.50 | 22.30 | Miss. Riv Com'n. |
| | March 13-14 | 23.00 | 22.80 | Miss. Riv. Com'n. |
| | July 5 | 20.70 | 20.50 | Miss. Riv. Com'n. |
| College Point | February 10-12 | 17.00 | 16.98 | Miss. Riv. Com'n. |
| | March 13-14 | 17.48 | 17.46 | Miss. Riv. Com'n. |
| | July 6 | 15.85 | 15.83 | Miss. Riv. Com'n. |
| Carrollton | February 16 | 11.05 | 10.70 | Miss. Riv. Com'n. |
| | March 13-14 | 11.55 | 11.20 | Miss. Riv. Com'n. |
| | July 4 to 7 | 10.65 | 10.30 | Miss Riv. Com'n. |

## HIGH WATER RECORD—1890.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | March 24. | 22.50 | 719.48 | Weather Bureau. |
| Cincinnati | March 25-26 | 58.90 | 485.26 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | March 28 | 35.40 | 433.90 | Miss. Riv. Com'n. |
| Nashville | March 6. | 50.70 | ..... | Miss. Riv. Com'n. |
| Chattanooga | March 2. | 42.50 | 673.14 | Miss. Riv. Com'n. |
| St. Paul | June 23. | 7.00 | 680.00 | Weather Bureau. |
| Davenport | June 29. | 11.70 | 545.46 | Weather Bureau. |
| Omaha | June 9 | 12.90 | 971.61 | Weather Bureau. |
| Kansas City | June 11. | 17.20 | 733.90 | Weather Bureau. |
| St. Louis | July 1. | 20.60 | 399.57 | Miss. Riv. Com'n. |
| Cairo | March 12. | 48.80 | 318.38 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 22. | 34.90 | 242.19 | Miss. Riv. Com'n. |
| Memphis | March 16-17 | 35.60 | 218.31 | Miss. Riv. Com'n. |
| Helena | March 28 to 30. | 47.70 | 188.42 | Miss. Riv. Com'n. |
| Mouth White River | March 31 | 50.40 | 157.87 | Miss. Riv. Com'n. |
| Fort Smith | Mar. 12 to April 28 | 21.00 | 395.25 | Weather Bureau. |
| Little Rock | April 29 | 26.80 | 247.09 | Miss. Riv. Com'n. |
| Arkansas City | March 27. | 49.50 | 144.68 | Miss. Riv. Com'n. |
| Greenville | March 17-18-26-27. | 43.40 | 130.14 | Miss. Riv. Com'n. |
| Lake Providence | March 22 to 26. | 40.30 | 108.66 | Miss. Riv. Com'n. |
| Vicksburg | March 15. | 48.00 | 92.78 | Miss. Riv. Com'n. |
| | April 23 to 27. | 49.00 | 93.78 | Miss. Riv. Com'n. |
| St. Joseph | March 15. | 44.10 | 75.56 | Miss. Riv. Com'n. |
| | April 23 to 25. | 45.10 | 76.56 | Miss. Riv. Com'n. |
| Natchez | March 15-16. | 46.90 | 62.53 | Miss. Riv. Com'n. |
| | April 23. | 48.60 | 64.23 | Miss. Riv. Com'n. |
| Fulton, Ark | May 3. | 34.00 | 257.52 | Miss. Riv. Com'n. |
| Shreveport | May 7. | 34.40 | 174.41 | Miss. Riv. Com'n. |
| Alexandria | May 19. | 36.80 | 80.00 | Miss. Riv. Com'n. |
| Barbre's Landing | April 23. | 49.60 | 52.51 | Miss. Riv. Com'n. |
| Red River Landing | March 17 to 23. | 45.00 | 47.59 | Miss. Riv. Com'n. |
| | April 23. | 48.60 | 51.19 | Miss. Riv. Com'n. |
| Bayou Sara | March 18 to 20. | 38.50 | 41.19 | Miss. Riv. Com'n. |
| | April 21. | 41.20 | 43.89 | Miss. Riv. Com'n. |
| Baton Rouge | March 16 to 18. | 35.40 | 34.20 | Miss. Riv. Com'n. |
| | April 21. | 36.60 | 35.40 | Miss. Riv. Com'n. |
| Plaquemine | March 16-17. | 31.40 | 31.20 | Miss. Riv. Com'n. |
| | April 22. | 31.90 | 31.70 | Miss. Riv. Com'n. |
| College Point | March 16. | 23.80 | 23.78 | Miss. Riv. Com'n. |
| Carrollton | March 14 to 17. | 16.00 | 15.65 | Miss. Riv. Com'n. |
| New Orleans | March 21. | 16.70 | 14.19 | Weather Bureau. |

## HIGH WATER RECORD—1891.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | February 18 | 31.30 | 728.28 | Weather Bureau. |
| Cincinnati | February 25 | 59.30 | 483.66 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 27 | 32.40 | 430.90 | Miss Riv. Com'n. |
| Nashville | March 13-14 | 49.20 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 14 | 37.50 | 668.14 | Miss. Riv. Com'n. |
| St. Paul | April 17 | 6.40 | 679.40 | Weather Bureau. |
| Davenport | May 3 to 5 | 10.30 | 544.06 | Weather Bureau. |
| Omaha | June 29-30 | 14.40 | 973.11 | Weather Bureau. |
| Kansas City | July 1 | 23.10 | 402.67 | Weather Bureau. |
| St. Louis | April 25 | 23.60 | 402.57 | Miss. Riv. Com'n. |
| | July 4 | 23.70 | 402.67 | Miss. Riv Com n. |
| Cairo | March 3 to 6 | 46.20 | 315.78 | Miss. Riv. Com'n. |
| Fulton Tenn | March 14 | 33.90 | 241.19 | Miss. Riv. Com'n. |
| Memphis | March 13-14 | 34.70 | 217.41 | Miss Riv. Com'n. |
| Helena | March 26 to 28 | 44.70 | 185.42 | Miss. Riv. Com'n |
| Mouth White River | April 5-6 | 47.70 | 155.17 | Miss. Riv. Com'n. |
| Fort Smith | June 8. | 20.40 | 394.65 | Weather Bureau. |
| Little Rock | April 23 | 22.60 | 242.89 | Miss. Riv. Com'n. |
| Arkansas City | April 3 to 7 | 48.20 | 143.38 | Miss. Riv. Com'n. |
| Greenville | April 1 to 3 | 43.20 | 129.94 | Miss. Riv. Com'n. |
| Lake Providence | Mch. 31 to Apr. 4 | 41.00 | 109.36 | Miss. Riv. Com'n. |
| Vicksburg | April 2 to 4 | 48.10 | 92.88 | Miss. Riv. Com'n. |
| St. Joseph | April 11 | 43.80 | 75.26 | Miss. Riv. Com'n. |
| Natchez | April 11-12 | 46.50 | 62.13 | Miss. Riv. Com'n. |
| Fulton, Ark | April 27 | 30.30 | 253.82 | Miss. Riv. Com'n. |
| Shreveport | February 12-13 | 25.20 | 165.21 | Miss. Riv. Com'n. |
| Alexandria | February 17 | 30.00 | 73.20 | Miss. Riv. Com'n. |
| Barbre's Landing | Apr. 12 to May 5. | 45.60 | 48.51 | Miss. Riv. Com'n. |
| Red River Landing | Apr. 26 to May 4. | 45.50 | 47.79 | Miss. Riv. Com'n. |
| Bayou Sara | Apr. 29 to May 6. | 38.80 | 41.49 | Miss. Riv. Com'n. |
| Baton Rouge | April 26 to 29 | 35.50 | 34.30 | Miss. Riv. Com'n |
| Plaquemine | Apr. 29 to May 8. | 31.00 | 30.80 | Miss. Riv. Com'n. |
| Donaldsonville | March 18 | 27.90 | 26.12 | Miss. Riv. Com'n. |
| College Point | March 16 | 23.40 | 23.38 | Miss Riv. Com'n. |
| Carrollton | March 16 | 16.00 | 15.65 | Miss. Riv. Com'n. |
| New Orleans | March 17-18 | 16.40 | 13.89 | Weather Bureau. |
| Fort Jackson | March 31 | 6.40 | 4.40 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1892.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | January 15 | 22.90 | 729.88 | Weather Bureau. |
| Cincinnati | April 25 | 43.80 | 470.16 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | April 23 | 21.60 | 420.10 | Miss. Riv. Com'n. |
| Nashville | April 26 | 38.80 | ..... | Miss. Riv. Com'n. |
| Chattanooga | April 10 | 34.30 | 664.94 | Miss. Riv. Com'n. |
| St. Paul | May 26 | 12.60 | 685.60 | Weather Bureau. |
| Davenport | June 27 | 19.40 | 553.16 | Weather Bureau. |
| Omaha | May 21 | 24.90 | 983.61 | Weather Bureau. |
| St. Louis | May 19 | 36.00 | 414.97 | Miss. Riv. Com'n. |
| Cairo | April 28 | 48.30 | 317.88 | Miss. Riv. Com'n. |
| Fulton, Tenn | April 29 to May 3. | 34.20 | 241.49 | Miss. Riv. Com'n. |
| Memphis | May 2-3 | 34.60 | 217.31 | Miss. Riv. Com'n. |
| Helena | May 11-12 | 45.70 | 186.42 | Miss. Riv. Com'n. |
| Mouth White River | June 1 | 49.30 | 156.77 | Miss. Riv. Com'n. |
| Fort Smith | May 19 | 30.90 | 405.15 | Weather Bureau. |
| Little Rock | May 21 | 31.20 | 251.49 | Miss. Riv. Com'n. |
| Arkansas City | June 1 | 50.00 | 145.18 | Miss. Riv. Com'n. |
| Greenville | June 1-2 | 44.20 | 130.94 | Miss. Riv. Com'n. |
| Lake Providence | June 2 | 41.90 | 110.26 | Miss. Riv. Com'n. |
| Vicksburg | June 2 to 4 | 48.40 | 93.18 | Miss. Riv. Com'n. |
| St. Joseph | June 2 to 5 | 44.50 | 75.98 | Miss. Riv. Com'n. |
| Natchez | June 26 | 48.10 | 63.73 | Miss. Riv. Com'n. |
| Fulton, Ark | May 23-24 | 34.80 | 258.32 | Miss. Riv. Com'n. |
| Shreveport | May 28 | 35.60 | 175.61 | Miss. Riv. Com'n. |
| Alexandria | June 12 to 14 | 38.20 | 81.40 | Miss. Riv. Com'n. |
| Barbre's Landing | June 28 | 49.70 | 52.61 | Miss. Riv. Com'n. |
| Red River Landing | June 26 to 30 | 48.80 | 51.39 | Miss. Riv. Com'n. |
| Bayou Sara | June 27 to 30 | 42.20 | 44.89 | Miss. Riv. Com'n. |
| Baton Rouge | June 26 to 28 | 38.40 | 37.20 | Miss. Riv. Com'n. |
| Plaquemine | June 13 | 33.50 | 33.30 | Miss. Riv. Com'n. |
| Donaldsonville | June 13 | 30.20 | 28.42 | Miss. Riv. Com'n. |
| College Point | June 12-13 | 25.40 | 25.38 | Miss. Riv. Com'n. |
| Carrollton | June 12-13 | 17.20 | 16.85 | Miss. Riv. Com'n. |
| New Orleans | June 11 | 17.60 | 13.09 | Miss. Riv. Com'n. |
| Fort Jackson | June 12-13 | 6.80 | 4.80 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1893.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | February 8 | 23.10 | 720.08 | Weather Bureau. |
| Cincinnati | February 21 | 54.60 | 480.96 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 21 | 28.70 | 427.20 | Miss. Riv. Com'n. |
| Nashville | February 22 | 40.80 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 20 | 33.40 | 664.04 | Miss. Riv. Com'n. |
| St. Paul | May 5 to 7 | 14.70 | 687.70 | Weather Bureau. |
| Davenport | May 14 | 13.60 | 547.36 | Weather Bureau. |
| Omaha | April 12 | 15.10 | 973.81 | Weather Bureau. |
| Kansas City | April 18 | 18.10 | 734.80 | Weather Bureau. |
| St. Louis | May 3 | 31.60 | 410.57 | Miss. Riv. Com'n. |
| Cairo | February 28 | 44.90 | 314.48 | Miss. Riv. Com'n. |
| | May 8 to 10 | 49.30 | 318.82 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 4-5 | 32.20 | 239.49 | Miss. Riv. Com'n. |
| | May 13 to 17 | 34.60 | 241.89 | Miss. Riv Com'n. |
| Memphis | March 3 | 33.00 | 215.71 | Miss. Riv. Com'n. |
| | May 15 to 17 | 35.20 | 217.91 | Miss. Riv. Com'n. |
| Helena | March 6-7 | 41.80 | 182.52 | Miss. Riv. Com'n. |
| | May 25 | 47.90 | 188.62 | Miss. Riv. Com'n. |
| Mouth White River | March 9-10 | 44.30 | 151.77 | Miss. Riv. Com'n. |
| | May 29 | 49.50 | 156.97 | Miss. Riv. Com'n. |
| Fort Smith | May 1 | 26.80 | 401.05 | Weather Bureau. |
| Little Rock | May 3 | 27.20 | 247.49 | Miss. Riv. Com'n. |
| Arkansas City | March 10 to 13 | 43.20 | 138.38 | Miss. Riv. Com'n. |
| | May 28-29 | 50.20 | 145.38 | Miss. Riv. Com'n. |
| Greenville | May 29 | 44.30 | 131.04 | Miss. Riv. Com'n. |
| Lake Providence | May 15 to 22 | 41.80 | 110.16 | Miss. Riv. Com'n. |
| Vicksburg | May 22-23 | 48.30 | 93.08 | Miss. Riv. Com'n. |
| St. Joseph | May 22-23 | 44.10 | 75.58 | Miss. Riv. Com'n. |
| Natchez | May 22 to 24 | 46.80 | 62.43 | Miss. Riv. Com'n. |
| Fulton, Ark | March 12-13 | 26.70 | 250.22 | Miss. Riv. Com'n. |
| Shreveport | January 1 | 29.10 | 169.11 | Miss. Riv. Com'n. |
| Alexandria | January 6-7 | 32.20 | 75.40 | Miss. Riv. Com'n. |
| Barbre's Landing | June 26 to 28 | 48.70 | 51.61 | Miss. Riv. Com'n. |
| Red River Landing | June 24 to 28 | 47.70 | 50.29 | Miss. Riv. Com'n. |
| Bayou Sara | June 24-25 | 41.50 | 44.19 | Miss. Riv. Com'n. |
| Baton Rouge | June 23 | 38.40 | 37.20 | Miss. Riv. Com'n. |
| Plaquemine | June 23 | 33.80 | 33.60 | Miss. Riv. Com'n. |
| Donaldsonville | June 23 | 30.60 | 28.82 | Miss. Riv. Com'n. |
| College Point | June 23 | 25.90 | 25.88 | Miss. Riv. Com'n. |
| Carrollton | June 22 to 24 | 17.40 | 17.05 | Miss. Riv. Com'n. |
| New Orleans | June 24 | 17.90 | 15.39 | Weather Bureau. |
| Fort Jackson | June 15 | 6.60 | 4.60 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1894.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | May 22 | 22.50 | 719.48 | Weather Bureau. |
| Cincinnati | February 15 | 35.60 | 461.96 | Miss. Riv. Com'n. |
| | May 27 | 31.90 | 458.26 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | February 14 | 12.70 | 411.20 | Miss. Riv. Com'n. |
| Nashville | February 9 | 42.00 | ..... | Miss. Riv. Com'n. |
| Chattanooga | February 6 | 25.50 | 656.14 | Miss. Riv. Com'n. |
| St. Paul | May 21 | 11.80 | 684.80 | Weather Bureau. |
| Davenport | May 31 | 12.30 | 546.06 | Weather Bureau. |
| Omaha | April 14 | 15.10 | 973.81 | Weather Bureau. |
| Kansas City | June 20-21 | 20.10 | 736.80 | Weather Bureau. |
| St. Louis | March 10 | 20.20 | 399.17 | Miss. Riv. Com'n. |
| | May 11 | 23.40 | 402.27 | Miss. Riv. Com'n. |
| Cairo | February 16 | 37.00 | 306.58 | Miss. Riv. Com'n. |
| Fulton, Tenn | February 18-19 | 27.80 | 235.09 | Miss. Riv. Com'n. |
| Memphis | February 19-20 | 29.00 | 211.71 | Miss. Riv. Com'n. |
| Helena | February 21 | 38.10 | 178.82 | Miss. Riv. Com'n. |
| Mouth White River | February 23-24 | 42.10 | 149.57 | Miss. Riv. Com'n. |
| Fort Smith | March 8-9 | 17.60 | 391.85 | Weather Bureau. |
| Little Rock | March 22 | 24.80 | 245.09 | Miss. Riv. Com'n. |
| Arkansas City | February 24-25 | 40.50 | 135.68 | Miss. Riv. Com'n. |
| Greenville | February 25 | 35.40 | 122.14 | Miss. Riv. Com'n. |
| Lake Providence | February 26 | 34.40 | 102.76 | Miss. Riv. Com'n. |
| Vicksburg | February 27 | 40.30 | 85.08 | Miss. Riv. Com'n. |
| | April 2 | 40.90 | 85.68 | Miss. Riv. Com'n. |
| St. Joseph | April 2-3 | 36.90 | 68.36 | Miss. Riv. Com'n. |
| Natchez | April 3-4 | 40.60 | 56.28 | Miss. Riv. Com'n. |
| Fulton, Ark | March 25 | 32.80 | 256.32 | Miss. Riv. Com'n. |
| Shreveport | April 2 | 34.40 | 174.41 | Miss. Riv. Com'n. |
| Alexandria | April 12-13 | 35.10 | 78.30 | Miss. Riv. Com'n. |
| Barbre's Landing | April 6-7 | 39.20 | 42.11 | Miss. Riv. Com'n. |
| Red River Landing | April 5-6 | 39.50 | 42.09 | Miss. Riv. Com'n. |
| Bayou Sara | April 5 to 7 | 33.10 | 35.79 | Miss. Riv. Com'n. |
| Baton Rouge | April 5-6 | 30.90 | 29.70 | Miss. Riv. Com'n. |
| Plaquemine | April 6 | 26.80 | 26.60 | Miss. Riv. Com'n. |
| Donaldsonville | April 6 | 24.40 | 22.62 | Miss. Riv. Com'n. |
| College Point | April 6 | 20.50 | 20.48 | Miss. Riv. Com'n. |
| Carrollton | April 5 to 7 | 13.40 | 13.05 | Miss. Riv. Com'n. |
| New Orleans | April 6 | 14.60 | 12.09 | Weather Bureau. |
| Fort Jackson | April 8-9 | 5.80 | 3.80 | Miss. Riv. Com'n. |
| | October 8 | *8.00 | 6.00 | Miss. Riv. Com'n. |

*Storm on Gulf.

## HIGH WATER RECORD—1895.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | January 8 | 25.70 | 722.68 | Weather Bureau. |
| Cincinnati | January 14 | 48.40 | 474.76 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | January 15 | 20.60 | 419.10 | Miss. Riv. Com'n. |
| Nashville | March 25 | 31.60 | ..... | Miss. Riv. Com'n. |
| Chattanooga | January 12 | 32.10 | 662.74 | Miss. Riv. Com'n. |
| St. Paul | June 16 and 17 | 4.60 | 667.60 | Weather Bureau. |
| Davenport | March 4 | 8.90 | 542.66 | Weather Bureau. |
| Omaha | June 8-9 | 12.00 | 970.71 | Weather Bureau. |
| Kansas City | June 12 | 16.90 | 733.60 | Weather Bureau. |
| St. Louis | July 8 | 17.00 | 395.97 | Miss Riv. Com'n. |
| | December 22 | 23.40 | 402.37 | Miss. Riv. Com'n. |
| Cairo | January 21-22 | 33.00 | 302.58 | Miss. Riv. Com'n. |
| Fulton, Tenn | Jan. 23-24-Mar. 28. | 23.00 | 230.29 | Miss Riv. Com'n. |
| Memphis | Jan. 23-25-Mar. 29. | 24.00 | 206.71 | Miss. Riv. Com'n. |
| Helena | January 25-26 | 31.00 | 171.72 | Miss. Riv. Com'n. |
| | March 30-31 | 31.20 | 171.92 | Miss. Riv. Com'n. |
| Mouth White River | January 27 | 32.60 | 140.07 | Miss. Riv. Com'n. |
| | April 1 | 34.40 | 141.87 | Miss. Riv. Com'n. |
| Fort Smith | December 26 | 27.60 | 401.85 | Weather Bureau. |
| Liittle Rock | December 28 | 25.70 | 245.99 | Miss. Riv. Com'n. |
| Arkansas City | January 28 | 30.90 | 126.08 | Miss. Riv. Com'n. |
| | April 1 | 32.50 | 127.68 | Miss. Riv. Com'n. |
| Greenville | January 27 | 26.30 | 113.04 | Miss. Riv. Com'n. |
| | April 1 | 27.70 | 114.44 | Miss. Riv. Com'n. |
| Lake Providence | January 28-29 | 23.90 | 92.26 | Miss. Riv. Com'n. |
| | April 2-3 | 25 90 | 94.26 | Miss. Riv. Com'n. |
| Vicksburg | January 29-30 | 29.10 | 73.88 | Miss. Riv. Com'n. |
| | April 3 | 31.70 | 76.48 | Miss. Riv. Com'n. |
| St. Joseph | January 30 | 25.20 | 56.68 | Miss. Riv. Com'n. |
| | April 4-5 | 27.80 | 59.28 | Miss. Riv. Com'n. |
| Natchez | Jan. 31-Feb. 1 | 28.60 | 44.23 | Miss. Riv. Com'n. |
| | April 4-5 | 31.50 | 47.13 | Miss. Riv. Com'n. |
| Fulton, Ark | July 17 | 31.50 | 255.02 | Miss. Riv. Com'n. |
| Shreveport | July 29 | 30.30 | 170.31 | Miss. Riv. Com'n. |
| Alexandria | August 5 | 28.20 | 71.40 | Miss. Riv. Com'n. |
| Barbre's Landing | February 2-3 | 24.60 | 27.51 | Miss. Riv. Com'n. |
| | April 4-5 | 29.40 | 32.31 | Miss. Riv. Com'n. |
| Red River Landing | February 1 | 26.90 | 29.49 | Miss. Riv. Com'n. |
| | April 4-6 | 31.20 | 33.79 | Miss. Riv. Com'n. |
| Bayou Sara | February 2 | 20.70 | 23.29 | Miss. Riv. Com'n. |
| | April 5-6 | 24.70 | 27.29 | Miss. Riv. Com'n. |
| Baton Rouge | February 2 | 19.70 | 18.50 | Miss. Riv. Com'n. |
| | April 6 | 23.60 | 22.40 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1895.—Continued.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Plaquemine | February 3 | 16.10 | 15.90 | Miss Riv. Com'n. |
| | April 6-7 | 20.00 | 19.80 | Miss. Riv. Com'n. |
| College Point | February 2 | 11.80 | 11.78 | Miss. Riv. Com'n. |
| | April 6 | 15.10 | 15.08 | Miss. Riv. Com'n. |
| Carrollton | February 4 | 7.70 | 7.35 | Miss. Riv. Com'n. |
| | April 8 | 10.10 | 9.75 | Miss. Riv. Com'n. |
| New Orleans | April 8 | 11.10 | 8.59 | Weather Bureau. |
| Fort Jackson | February 2 | 3.80 | 1.80 | Miss. Riv. Com'n. |
| | April 2 | 4.60 | 2.60 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1896.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | April 1 | 19.40 | 716 38 | Weather Bureau. |
| Cincinnati | April 4 | 47.70 | 474.06 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | April 5. | 22.40 | 420.90 | Miss. Riv. Com'n. |
| Nashville | April 7-8 | 42.80 | ..... | Miss. Riv. Com'n. |
| Chattanooga | April 5 | 40.50 | 671.14 | Miss. Riv. Com'n. |
| St. Paul | May 21-22 | 10.50 | 683.50 | Weather Bureau. |
| Davenport | May 4-5 | 10.40 | 544.16 | Weather Bureau. |
| Omaha | April 9 | 11.70 | 970.41 | Weather Bureau. |
| Kansas City | May 22. ..... ..... | 19.20 | 735.90 | Weather Bureau. |
| St. Louis | May 26 | 27.70 | 406.67 | Miss. Riv. Com'n. |
| Cairo | February 18 | 32.30 | 301.88 | Miss. Riv. Com'n. |
| | April 13 | 39.10 | 308.68 | Miss. Riv Com'n. |
| Fulton, Tenn | February 19-20 | 22.80 | 230.09 | Miss. Riv. Com'n. |
| | April 15 | 28.10 | 235.39 | Miss. Riv. Com'n. |
| Memphis | February 20 | 23.80 | 206.51 | Miss. Riv. Com'n. |
| | April 15-16 | 29.40 | 112.11 | Miss. Riv. Com'n. |
| Helena | February 21-22 | 31.00 | 171.72 | Miss. Riv. Com'n. |
| | April 17 | 38.40 | 179.12 | Miss. Riv. Com'n. |
| Mouth White River | February 22-23 | 35.60 | 143.07 | Miss. Riv. Com'n. |
| | April 18-19 | 41.60 | 149.07 | Miss. Riv. Com'n. |
| Fort Smith | January 2 | 14.70 | 388.95 | Weather Bureau. |
| Little Rock | January 1 | 23.00 | 243.29 | Miss. Riv. Com'n. |
| Arkansas City | February 23-24 | 33.70 | 128.84 | Miss Riv. Com'n. |
| | April 19 | 40.00 | 135.18 | Miss. Riv. Com'n. |
| Greenville | February 23-24 | 28.80 | 115.54 | Miss. Riv. Com'n. |
| | April 20 | 34.60 | 121.34 | Miss. Riv. Com'n. |
| Lake Providence | February 24 | 27.40 | 95.76 | Miss. Riv. Com'n. |
| | April 20-21 | 33.20 | 101.56 | Miss. Riv. Com'n. |
| Vicksburg | February 25 | 32.60 | 77.38 | Miss Riv. Com'n. |
| | April 21 | 39.00 | 83.78 | Miss. Riv. Com'n. |
| St. Joseph | February 26 | 29 70 | 61.18 | Miss. Riv. Com'n. |
| | April 22 | 35.20 | 66.68 | Miss Riv. Com'n. |
| Natchez | February 25 to 27. | 33.00 | 48.63 | Miss. Riv. Com'n. |
| | April 22-23 | 38.20 | 53.83 | Miss. Riv. Com'n. |
| Fulton, Ark | January 1 | 21.80 | 245.32 | Miss. Riv. Com'n. |
| Shreveport | February 25-26 | 17.50 | 157.51 | Miss. Riv. Com'n. |
| Alexandria | February 6 | 26.40 | 69.60 | Miss. Riv. Com'n. |
| Barbre's Landing | February 28 | 32.90 | 35.81 | Miss. Riv. Com'n. |
| | April 23-24 | 35.80 | 38.71 | Miss. Riv. Com'n. |
| Red River Landing | February 27-28 | 33.40 | 35.99 | Miss. Riv. Com'n. |
| | April 23-24 | 37.40 | 39.99 | Miss. Riv. Com'n. |
| Bayou Sara | February 27 28 | 26.80 | 29.49 | Miss. Riv. Com'n. |
| | April 23-24 | 30.70 | 33.39 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1896.—Continued.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Baton Rouge | February 28 | 25.60 | 24.40 | Miss. Riv. Com'n. |
| | April 23 to 25 | 28.80 | 27.60 | Miss. Riv. Com'n. |
| Plaquemine | February 28 | 22.30 | 22.10 | Miss. Riv. Com'n. |
| | April 22 to 24 | 25.10 | 24.90 | Miss. Riv. Com'n. |
| Donaldsonville | February 26-27 | 20.40 | 18.62 | Miss. Riv. Com'n. |
| | April 22 to 25 | 23.00 | 21.22 | Miss. Riv. Com n. |
| College Point | February 28-29 | 16.90 | 16.88 | Miss. Riv. Com'n. |
| | April 22 to 24 | 19.20 | 19.18 | Miss. Riv. Com'n. |
| Carrollton | March 1 | 11.50 | 11.15 | Miss. Riv. Com'n. |
| | April 24-25 | 13.60 | 13.25 | Miss. Riv. Com'n. |
| New Orleans | April 23 | 14.70 | 12.19 | Weather Bureau. |
| Fort Jackson | February 29 | 5.00 | 3.00 | Miss. Riv. Com'n. |
| | April 19 | 5.90 | 3.90 | Miss. Riv. Com'n. |

## HIGH WATER RECORD—1897.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | February 24 | 28.90 | 725.88 | Weather Bureau. |
| Cincinnati | February 26 | 61.10 | 487.46 | Miss. Riv. Com'n. |
| Louisville, up'r gauge | February 28 | 35.30 | 433.80 | Miss. Riv. Com'n. |
| Nashville | March 20 | 48.80 | | Miss. Riv Com'n. |
| Chattanooga | March 14-15 | 37.90 | 668.54 | Miss. Riv. Com'n. |
| St. Paul | April 6 | 18.00 | 691.00 | Weather Bureau. |
| Davenport | April 17 | 15.00 | 548.76 | Weather Bureau. |
| Omaha | April 15 to 17 | 17.10 | 975.81 | Weather Bureau. |
| Kansas City | April 17 | 27.80 | 744.50 | Weather Bureau. |
| St Louis | May 2 | 30.90 | 409.87 | Miss. Riv. Com'n. |
| Cairo | March 25-28 | 51.70 | 321.28 | Miss. Riv. Com'n. |
| Fulton, Tenn | March 23 | 37.47 | 244.76 | Miss. Riv. Com'n. |
| *Memphis | March 20 | 37.66 | 220.37 | Miss. Riv. Com'n. |
| *Helena | April 4 | 51.75 | 192.47 | Miss. Riv. Com'n. |
| *Mouth White River | March 29 | 52.42 | 159.89 | Miss. Riv. Com'n. |
| Fort Smith | March 20 | 17.00 | 391.25 | Weather Bureau. |
| Little Rock | March 22 | 22.90 | 243.19 | Miss. Riv. Com'n. |
| *Arkansas City | March 29 | 51.90 | 147.08 | Miss. Riv. Com'n. |
| *Greenville | March 29 | 46.75 | 133.49 | Miss. Riv. Com'n. |
| *Lake Providence | March 30 | 44.54 | 112.90 | Miss. Riv. Com'n. |
| | April 7-8 | 43.40 | 111.76 | Miss. Riv. Com'n. |
| | April 15 to 17 | 44.20 | 112.56 | Miss. Riv. Com'n. |
| *Vicksburg | April 16 | 52.48 | 97.26 | Miss. Riv. Com'n. |
| *St. Joseph | April 17 | 47.85 | 79.31 | Miss. Riv. Com'n. |
| *Natchez | May 2 | 49.82 | 65.49 | Miss. Riv. Com'n. |
| Fulton, Ark | March 23 | 28.60 | 254.12 | Miss. Riv Com'n. |
| Shreveport | April 11 to 13 | 24.10 | 164.11 | Miss. Riv. Com'n. |
| Alexandria | April 14 to 16 | 26.20 | 69.40 | Miss. Riv. Com'n. |
| *Barbre's Landing | May 13-14 | 50.95 | 53.86 | Miss. Riv. Com'n. |
| *Red River Landing | May 13 to 16 | 50.20 | 52.79 | Miss. Riv. Com'n. |
| *Bayou Sara | May 14-15 | 43.70 | 46.39 | Miss. Riv. Com'n. |
| *Baton Rouge | May 13 to 15 | 40.65 | 39.45 | Miss. Riv. Com'n. |
| *Plaquemine | May 13 to 17 | 36.25 | 36.05 | Miss. Riv. Com'n. |
| *Donaldsonville | May 13 | 32.75 | 30.87 | Miss. Riv. Com'n. |
| *College Point | May 15 | 27.95 | 27.93 | Miss. Riv. Com'n. |
| *Carrollton | May 13 | 19.17 | 18.85 | Miss. Riv. Com'n. |
| *New Orleans | May 13 | 19.50 | 16.99 | Weather Bureau. |
| Fort Jackson | April 22-23-29 | 7.20 | 5.20 | Miss. Riv. Com'n. |
| | May 14-16 | 7.2 | 5.20 | Miss. Riv. Com'n. |

*Highest recorded water.

## HIGH WATER RECORD—1898.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pitttsburg | March 24 | 26.60 | 723.58 | Weather Bureau. |
| Cincinnati | March 24 | 61.40 | 487.76 | Miss. Riv. Com'n. |
| Louisville, up'r gauge | March 30 | 36.20 | 434.70 | Miss. Riv. Com'n. |
| Nashville | January 23 | 38.80 | | Miss Riv Com'n. |
| Chattanooga | March 24 | 38.90 | 669.54 | Weather Bureau. |
| St. Paul | May 29 | 10.80 | 683.80 | Weather Bureau. |
| Davenport | June 24 | 7.50 | 541.26 | Weather Bureau. |
| Omaha | June 6 | 13.70 | 972.41 | Weather Bureau. |
| Kansas City | June 12 | 21.30 | 738.00 | Weather Bureau. |
| St. Louis | May 28 | 27.20 | 406.17 | Miss. Riv. Com'n. |
| Cairo | April 6 | 49.78 | 319.36 | Miss. Riv. Com'n. |
| *Fulton, Tenn | April 10 | 38.30 | 245.59 | Miss. Riv. Com'n. |
| Memphis | April 10 | 37.59 | 220.30 | Miss. Riv. Com'n. |
| Helena | April 17 | 49.11 | 189.83 | Miss. Riv. Com'n. |
| Mouth White River | April 19 | 51.05 | 158.52 | Miss. Riv. Com'n. |
| Little Rock | May 11 | 29.30 | 249.59 | Miss. Riv. Com'n. |
| Arkansas City | April 19-21 | 51.13 | 146.31 | Miss. Riv. Com'n. |
| Greenville | April 21 | 46.16 | 132.90 | Miss. Riv. Com'n. |
| Lake Providence | April 23 | 44.35 | 112.71 | Miss. Riv. Com'n. |
| Vicksburg | April 24-25 | 49.40 | 94.18 | Miss. Riv. Com'n. |
| St. Joseph | April 25 | 45.06 | 76.54 | Miss. Riv. Com'n. |
| Natchez | April 26-27 | 47.40 | 63.03 | Miss. Riv. Com'n. |
| Fulton, Ark | May 11 | 27.90 | 251.42 | Miss. Riv. Com'n. |
| Shreveport | May 21 | 15.00 | 155.01 | Miss. Riv. Com'n. |
| Alexandria | January 23 | 17.40 | 60.60 | Miss Riv. Com'n. |
| Barbre's Landing | May 2 | 42.85 | 45.76 | Miss. Riv. Com'n. |
| Red River Landing | April 28 to 30 | 44.30 | 46.89 | Miss. Riv. Com'n. |
| Bayou Sara | April 27 to 30 | 37.50 | 40.19 | Miss. Riv. Com'n. |
| Baton Rouge | April 29-30 | 34.60 | 33.40 | Miss. Riv. Com'n. |
| Plaquemine | April 29-30 | 30.60 | 30.40 | Miss. Riv. Com'n. |
| Donaldsonville | April 28-29 | 27.95 | 26.17 | Miss. Riv. Com'n. |
| College Point | April 27 to 30 | 23.50 | 23.48 | Miss. Riv. Com'n. |
| Carrollton | April 25 | 15.90 | 15.55 | Miss. Riv. Com'n. |
| New Orleans | April 28 | 17.00 | 14.49 | Weather Bureau. |
| Fort Jackson | April 23 to 26 | 6.70 | 4.70 | Miss. Riv. Com'n. |

* Highest water on record.

## HIGH WATER RECORD—1899.

| STATION | DATE OF READING | Recorded height on gauge—feet | Elevation above mean gulf level—feet | AUTHORITY |
|---|---|---|---|---|
| Pittsburg | February 26 | 20.50 | 717.38 | Weather Bureau. |
| Cincinnati | March 8 | 57.30 | 483.66 | Miss. Riv. Com'n. |
| Louisville, upp'r gauge | March 10 | 82.80 | 431.30 | Miss. Riv. Com'n. |
| Nashville | February 11 | 40.60 | | Miss. Riv. Com'n. |
| Chattanooga | March 22 | 40.00 | 670.64 | Miss. Riv. Com'n. |
| St. Paul | June 3 | 11.10 | 684.10 | Weather Bureau. |
| Davenport | June 27 | 11.80 | 545.5 | Weather Bureau. |
| Omaha | June 30 | 13.60 | 972.31 | Weather Bureau. |
| Kansas City | June 28 | 21.10 | 737.80 | Weather Bureau. |
| St. Louis | April 27 | 25.68 | 404.65 | Miss. Riv. Com'n. |
| Cairo | April 2 | 46.24 | 315.82 | Miss. Riv. Com'n. |
| Fulton, Tenn | April 7 | 34.90 | 242.19 | Miss. Riv. Com'n. |
| Memphis | April 1-11 | 35.20 | 217.91 | Miss. Riv. Com'n. |
| Helena | April 12-15 | 46.75 | 187.47 | Miss. Riv. Com'n. |
| Mouth White River | April 15-16 | 48.49 | 155.96 | Miss. Riv. Com'n. |
| Little Rock | May 11 | 25.90 | 248.19 | Miss. Riv. Com'n. |
| Arkansas City | April 15-20 | 48.60 | 143.78 | Miss. Riv. Com'n. |
| Greenville | April 17-20 | 43.00 | 129.74 | Miss. Riv. Com'n. |
| Lake Providence | April 16-21 | 41.65 | 110.01 | Miss. Riv. Com'n. |
| Vicksburg | April 17-23 | 47.30 | 92.08 | Miss. Riv. Com'n. |
| St. Joseph | April 21-24 | 43.25 | 74.73 | Miss. Riv. Com'n. |
| Natchez | April 23-25 | 46.15 | 61.78 | Miss. Riv. Com'n. |
| Fulton, Ark | November 28 | 26.60 | 250.12 | Miss. Riv. Com'n. |
| Shreveport | January 24 | 15.60 | 155.61 | Miss. Riv. Com'n. |
| Alexandria | January 27 | 18.20 | 61.40 | Miss. Riv. Com'n. |
| Barbre's Landing | April 25-28 | 41.60 | 44.51 | Miss. Riv. Com'n. |
| Red River Landing | April 22-27 | 43.30 | 45.89 | Miss. Riv. Com'n. |
| Bayou Sara | April 21-26 | 36.70 | 39.39 | Miss. Riv. Com'n. |
| Baton Rouge | April 21-28 | 33.70 | 32.50 | Miss. Riv. Com'n. |
| Plaquemine | April 21-25 | 30.10 | 29.90 | Miss. Riv. Com'n. |
| Donaldsonville | April 21 | 27.50 | 25.72 | Miss. Riv. Com'n. |
| College Point | April 21 | 23.15 | 23.13 | Miss. Riv. Com'n. |
| Carrollton | April 21 | 16.00 | 15.65 | Miss. Riv. Com'n. |
| New Orleans | April 22 | 17.20 | 14.69 | Weather Bureau. |
| Fort Jackson | April 21 | 6.98 | 4.98 | Miss. Riv. Com'n. |

NOTE—"Mean Gulf Level," as referred to in the foregoing "High Water Records," was provisionally determined at Biloxi, Miss., in 1885, by the Mississippi River Commission; and is 21.26 feet above the plane of reference used by Engineers known as "Cairo Datum," or 8.13 feet above plane of reference known as "Memphis Datum."

## Highest and Lowest Stages of the Mississippi River and Tributaries from Records of Mississippi River Commission at U. S. Weather Bureau.

| HIGHEST. | | | | LOWEST. | | | | |
|---|---|---|---|---|---|---|---|---|
| Station. | Date of Reading. | Recorded height on gauge—feet. | Elevation above mean gulf level—feet. | Date of Reading. | Recorded height on gauge—feet. | Elevation above mean gulf level—feet. | Oscillation. | Authority. |
| Pittsburg | Feb. 10, 1832 | 35.00 | 731 98 | Sept. 28, 1881. | —1.30 | 695 68 | 36.30 | W. B. |
| Cincinnati | Feb. 14, 1884 | 71.06 | 497.42 | Sept. 15, 1881 | 1.92 | 428.28 | 69.14 | M.R. C. |
| Louisville, upper gauge | Feb. 16, 1884 | 46.60 | 445.10 | Sept. 10-14-18-22, 1883. Nov. 14-15,1895. | 1.70 | 400.20 | 44.90 | M.R. C. |
| Nashville | Jan. 22, 1882 | 55.30 | ..... | Oct. 15 1878 | —0.40 | ..... | 55.70 | M.R. C. |
| Chattanooga | March 1, 1875 | 54.00 | 684 65 | Sept. 11-14,1881. Sept. 19, 1883.. | 0.00 | 630.64 | 54.00 | M.R. C. |
| St. Paul | April 29, 1881 | 19.70 | 692.70 | Aug. 6, 1894 .. March 21, 1895. | 0.20 | 673.20 | 19.50 | W. B. |
| Davenport | June 27, 1892 | 19 40 | 553.16 | Jan. 6, 1890 | —0.8 | 532.96 | 20.20 | W. B. |
| Omaha | April 24, 1881 | 23.80 | 982.51 | Dec. 3, 1867 | 1.6 | 960.31 | 22.20 | W. B. |
| Kansas City | June 20, 1844 | 37.00 | 753.70 | Dec. 2, 1874 | 1.5 | 718.20 | 35.50 | W. B. |
| St. Louis | June 28, 1844 | 41.39 | 420.36 | Jan. 27, 1895 | —0.60 | 378.37 | 41.99 | M.R. C. |
| Cairo | Feb. 27. 1883 | 52.17 | 321.75 | Dec. 24, 1871 | —1.00 | 268.58 | 53 17 | M.R. C. |
| Fulton, Tenn | April 10, 1898 | 38 30 | 245.59 | Nov. 7-8, 1895 | 0.16 | 207.45 | 38.14 | M.R. C. |
| Memphis | March 20, 1897 | 37.66 | 220 37 | Nov. 6-9, 1895 | —2 65 | 180.06 | 40 31 | M.R. C. |
| Mouth White River | March 29, 1897. | 52.42 | 159.89 | Dec. 28, 1872 | 0 00 | 107.47 | 52.42 | M.R. C. |
| Fort Smith | May 19, 1892 | 30.90 | 405.15 | Oct. 28, 1893 | —1.00 | 373 25 | 31.90 | W. B. |
| Little Rock | May 21, 1892 | 31.20 | 251.49 | Oct. 23-24, 1879. | —1.00 | 219.29 | 32.20 | M.R. C. |
| Arkansas City | March 29, 1897. | 51.90 | 147.08 | Nov. 9-10, 1895. | —3.60 | 91.58 | 55 50 | M.R. C. |
| Greenville | March 29. 1897. | 46.75 | 133 49 | Nov. 10 11,1895 | —2.55 | 84 19 | 49.30 | M.R. C. |
| Lake Providence | March 30, 1897. | 44.54 | 112.90 | Nov. 17, 1895 | —5.30 | 63.06 | 49.84 | M.R. C. |
| Vicksburg | April 16, 1897 | 52.48 | 97.26 | Nov. 13-14, 1895. | —6.50 | 38.28 | 58.98 | M.R. C. |
| St. Joseph | April 17, 1897 | 47.85 | 79.33 | Nov. 13, 1895 | —9.30 | 22.18 | 57.15 | M.R. C. |
| Natchez | May 2. 1897 | 49.82 | 65 45 | Nov. 13-15, 1895. | —0.85 | 14.78 | 50.67 | M.R. C. |
| Fulton, Ark | July 17, 1876 | 35.75 | 259 27 | Oct. 19. 1896. | 0.10 | 223.62 | 35.65 | M.R. C. |
| Shreveport | May 28, 1892 | 35 70 | 175.71 | Dec. 2-4, 1894 | —5.50 | 134.51 | 41.20 | M.R. C. |
| Alexandria | June 12, 1892 | 38.25 | 81.45 | Sept. 29, 1882 | —3.70 | 39.50 | 41.95 | M.R. C. |
| Barbre's Landing | May 13-14, 1897. | 50 95 | 53.86 | Nov. 13, 1895. | —1.77 | 1.14 | 52.72 | M.R. C. |
| Red River Landing | May 14-15, 1897. | 50 20 | 52 79 | Nov. 14, 1895 | —0.60 | 1.99 | 50.80 | M.R. C. |
| Bayou Sara | May 13-15, 1897 | 43.70 | 46.39 | Nov. 16, 1895 | —2.80 | —0.11 | 46.50 | M.R. C. |
| Baton Rouge, | May 13-15, 1897. | 40.65 | 39 45 | Nov. 14, 1895 | 0.45 | — .75 | 40.20 | M.R. C. |
| Plaquemine | May 13 17, 1897. | 36.25 | 36.05 | Nov. 14, 1895 | —0.94 | —1.14 | 37.19 | M.R. C |
| Donaldsonville | May 13-17, 1897. | 32.75 | 30 97 | Nov. 11, 1895 | 1.00 | —0.78 | 31.75 | M.R. C. |
| College Point | May 15, 1897 | 27.95 | 27 93 | Nov. 14, 1895 | —0.91 | —0.93 | 28.86 | M.R. C. |
| Carrollton | May 13, 1897 | 19.17 | 18.82 | Dec. 27, 1872 | —1.60 | —1.95 | 20.77 | M.R. C. |
| Fort Jackson | April 22-23-29. May 14-16 | 7.2 | 5.2 | Dec. 7, 1893 | 0.40 | —1.60 | 6.80 | M.R. C. |

# INDEX.

## A



## B

## C

## D



## E



## F

## U



## V



## W